Event-Based Media Monitoring Methodology for Human Rights Watch

Acknowledgements

Preparation of this report was made possible through the support of Human Rights Watch (HRW), an independent, international organization dedicated to "defend the rights of people worldwide." HRW investigate abuses, expose facts, and pressures those with power to respect rights and secure justice.

We, the authors, are five graduate students at the University of Minnesota, and this report was written as part of the human rights capstone project. A special thanks to Dr. James Ron and Dr. Mary Curtin for their supervision, continued support, and insightful feedback. We would like to thank Brian Root for his extensive guidance throughout the development of this report. We appreciate the time and thoughtful consideration Iain Levine and Brian Root provided to identify research opportunities for collaboration with our team. We are indebted to the human rights practitioners and academics who contributed time and insight into this report through key informant interviews. Finally, we hope that this report will strengthen HRW's efforts to identify human rights abuses and advocate for people's rights worldwide.

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Executive Summary

This report, prepared by a team of researchers from the University of Minnesota for Human Rights Watch (HRW), investigates the use of event-based media monitoring (EMM) to review its application, identify its strengths and weaknesses, and offer suggestions on how HRW can better utilize EMM in its own work.

Media monitoring systems include both human-operated (manual) and automated systems, both of which we review throughout the report. The process begins with the selection of news sources, proceeds to the development of a coding manual (for manual searches) or "dictionary" (for automated searches), continues with gathering data, and concludes with the coding of news stories.

EMM enables the near real-time tracking of events reported by the media, allowing researchers to get a sense of the scope of and trends in an event, but there are limits to what EMM can accomplish on its own. The media will only cover a portion of a given event, so information will always be missing from EMM data. EMM also introduces research biases of various kinds; mitigating these biases requires careful selection of media sources and clearly defined coding manuals or dictionaries.

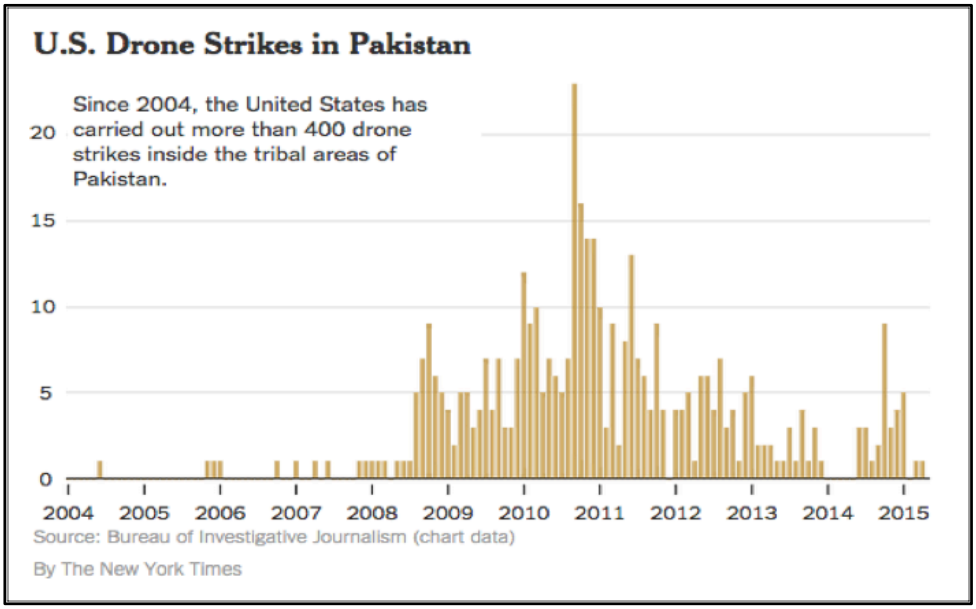
In manual EMM, coding the gathered data requires human researchers to apply codebook rules in order to collect consistent data from each story they read. In automated EMM, computers apply the dictionary directly to the news stories, automatically picking up the desired information. There are trade-offs in each system. Automated EMM can code stories far more quickly, but the software may incorrectly code stories, requiring manual corrections. Conversely, manual EMM allows for a more nuanced analysis, but the investment of time and effort may diminish the tool's utility. We believe that both manual and automated EMM, when deployed correctly, can effectively support human rights research and advocacy.

Background

In October 2014, Human Rights Watch (HRW) released the report *Those Terrible Weeks in their Camp: Boko Haram Violence against Women and Girls in Northeast Nigeria*. Among other sources, HRW monitored local and international news media reports to estimate over 7,000 civilian deaths from Boko Haram-related violence. To arrive at this figure, HRW systematically monitored credible regional and international media and cross-referenced those reports with information from police, hospital workers, and victims' families. Using this information, researchers built a database of events to draw conclusions about the problem's scope and trends, augmenting HRW's in-depth descriptions of the human cost.

A wide variety of organizations now use media monitoring of one sort or another to gather information on civil unrest and human rights violations, and their data has begun to appear in the mainstream media. Consider, for example, the April 23, 2015 *New York Times* article using media monitoring data from the Bureau of Investigative Journalism, a non-governmental organization, that charted 400 United States (U.S.) drone strikes since 2004 inside the tribal areas of Pakistan (see Figure 1). Events-based media monitoring (EMM) of this kind is powerful because it gives researchers the ability to quickly and efficiently gather and analyze large amounts of data.

***Figure 1*. Use of media monitoring in current news**



This report does not cover the full range of media monitoring methods but instead focuses on EMM. Another media monitoring technique is content analysis, which analyzes the type of information the media provides to readers instead of counting events. Content analysis can help observers track, for example, how coverage of specific issues changes over time such as changes in the Indian media's coverage of gender-based violence.

Widely available online news reports and computer-based monitoring technologies have dramatically reduced the costs of gathering and analyzing event data. However, information reliability depends on the accuracy of both the news reports used as sources as well as the data-harvesting and analysis methods used to gather information from those news reports. Researchers must weigh tradeoffs between monitoring a wide array of sources to ensure comprehensive coverage and monitoring fewer sources to reduce the required effort or eliminate less reliable media sources.

Scope

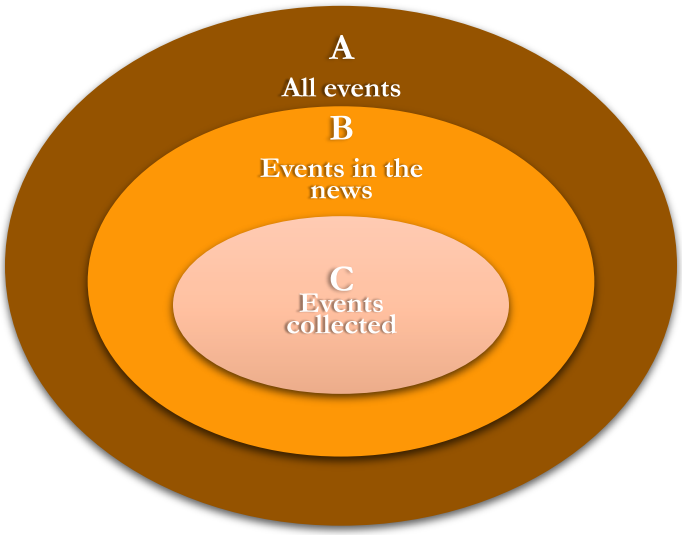


Figure 2. **Representation of Events in the Media**

The media does not report on *all* events of interest. Consider Figure 2: "A" represents all occurrences of the events of interest, and "B" represents the events captured and reported in the news. "B" is a subset of "A;" that is, "A" is always larger than "B".

Information on events collected through media monitoring "C" is always a subset of events reported in the news "B." "B," in other words, is always larger than "C." Therefore, A>B>C.

EMM practices cannot change the size of "B" relative to "A," but HRW must nevertheless be mindful of this gap, which can be reduced through triangulating news reports with other data. Our report is concerned with the size of "C" (events collected) relative to "B" (events in the news). More specifically, we are concerned with ways of maximizing "C" so that it is as close to "B" as possible.

Automated EMM systems

Whether done by humans or by machines, the process of media monitoring is functionally identical. It involves developing a systematic way to track reporting on a given event in a selected sample of media, such as reports of attacks by Boko Haram appearing in Nigerian newspapers. An EMM system is considered "automated" if a computer, rather than a human, reads and extracts specific event data from a news story. It requires decisions about which media sources to track, what information to look for, how to manage the monitoring process, and what to do with the collected information. EMM can incorporate automated tools at any stage of the process.

In automated EMM researchers can enter the process at any stage, including during the selection of news sources, determination of relevant events, or extraction and analysis of data. In theory, a programmer could customize an automated system to a project by specifying the news sources and creating a customized "dictionary" that extracts text on specific events and names. This information could be used to build a set of data about the target event(s). A customized system involves computer-programming skills and is best done in partnership with an existing private agency or scholarly collaborator. HRW should consider developing its own in-house capacity to build customized EMM searches.

Automated EMM can rely on existing open-source systems, which provide the opportunity to either draw from ready-to-use data prepared by others or develop custom-made systems. To evaluate open-source automated systems, we looked closely at the Phoenix Data Project, the latest development of an academic consortium from the Open Event Data Alliance, and at the private analytics company Caerus Associates. Phoenix's data is free to access and is uploaded daily; any organization can access the data without embarking on a broader media monitoring process. However, this approach requires working with data on events decided by others and collected from specific, pre-selected sources (See Appendix B-1). To lessen the limitation of using pre-selected sources, a company such as Caerus could develop a customized automated system for HRW's specific research needs for a select project. In Appendix B-4 we include a proposal from Caerus on the design of a potential partnership with HRW. As a general rule, greater EMM precision and customization will always be associated with greater costs. As noted above, HRW can reduce these costs through collaborations with others or by developing its own automated EMM capacities.

Manual EMM systems

Manual EMM involves a human reading media reports and using her discretion in source selection, systematic data extraction, and coding. Still, most manual EMM systems search digital sources and exclude sources that do not publish online.

Methodology

We reviewed academic and practitioner literature and interviewed 14 key informants working with EMM in academia and applied research. We recorded our interviews (by consent), took notes, and wrote summary memos. We tracked our online search terms in a spreadsheet to ensure coverage of all relevant areas, avoid duplication, and allow for replication. We also present ten case studies (Appendix A) to highlight different EMM applications.

Findings

As relevant EMM tools and sources vary by project, it is important to clearly identify a project's goals and objectives before designing a monitoring protocol.

Determining Which News Sources to Monitor

Once an organization determines the purpose of its EMM project, it can select media sources for data extraction. These sources will vary depending on whether researchers are using automated or manual systems. Researchers must also be aware of media event reporting biases and their effect on EMM results. Table 1 details some of the primary biases to consider:

Table 1. **Biases and Examples**

Bias	What does it ask?	Case	Implications of bias on case
Selection Bias	Is the event "newsworthy?" What discretion was used in selecting the event?	Police killings in the United States: While local media will generally cover a killing by police, there are too many incidents for national media to reliably cover all events.	Only the most newsworthy police killings will make it to the national media, meaning overall numbers reported will be below actual number of events and that local newspapers may be better sources.
Significance Bias	Are events involving people or areas of interest to a specific audience (e.g. the public) reported?	One-sided violence: Using UCDP GED, 64% (or 35 of the 55 stories) of civilian victims were people of public interest such as politicians or employees at large companies, and the other 36% were "ordinary" people (Otto 2013).	Reported cases of one-sided violence involving persons of significance or interest to the people, potentially leading to an underreporting of civilians not of public interest.
Omission Bias (Description Bias)	Has information been omitted/is there a lack of information regarding the event in the report?	One-sided violence: For something to be coded as "one-sided violence" by UCDP GED, three things must be known: 1) If the perpetrator is part of an organized armed group, 2) if the person killed was a civilian, 3) context identifying whether the civilians were accidentally killed or the target of the violence (Otto 2013).	If an article does not have this information included, there is a higher chance of coding the event improperly (i.e. the wrong type of violence) (Otto 2013).
Proximity/Access Bias	Was there easier access to this event, leading it to be reported over others?	Kidnapping by Boko Haram: There were limited news reports from data-poor regions such as northern Nigeria where the actual violence was prevalent. (HRW)	Information for that region regarding the event may not be reported due to limited access to area.
Event-size Bias	Is the event being overstated or understated? (Generally "biased data will overstate the relative importance larger events and understate the frequency of smaller events" [Ball and Price 2014]).	Iraq Body Count (IBC): Ball and Price (2014) analyzed the proportion of events at different sizes with different numbers of sources in IBC Events with one victim have a mean of 2.8 sources per record, whereas events with 6-14 victims have 7.6 sources per record, and events with fifteen or more victims have an average of 12.5 sources per record. Additionally, largest events, on average, have about 170–350% more sources compared to the smallest events.	If large and small events differ in other ways (i.e., different perpetrators, different kinds of victims, different kinds of weapons), then analysis of those differences using the raw data will be inaccurate.
Source Bias (Description Bias)	Is the source of the reported event involved in the conflict or situation? Is the source a party of interest? Whose point of view is the story being told from?	State violence in Guatemala: Variations in reporting occurred specific to the event and the nature of violence.	Variation in data on the same event: Newspapers focused on reporting recent disappearances and killings in urban environments; human rights organizations focused on reporting large numbers of killings throughout the country and interviews focused on recent disappearances in rural environments.
Media Fatigue	Has the event been "over-covered" to the point that audiences are no longer interested and, as a result, the media is now underreporting?	Mainstream media coverage of events in Syria dropped off throughout 2013, failing to pick up on chemical weapons attacks being reported by citizen journalists. It was not until President Obama confirmed the attack at Ghouta that mainstream coverage increased.	There may be ample data about an event for a period of time; however, the number of sources covering the event can dwindle as it stretches out over a long period of time.

Scope of Sources

Depending on the project's goals, issues, and events, researchers may need a wide or narrow range of media sources. Researchers must weigh the benefits of increasing the number of sources to ensure comprehensive coverage against the additional resources required to obtain and analyze copious data.

For an example of time-limited EMM, consider election monitoring (Appendix A-1). The primary goal for election observers conducting EMM is to verify whether the national media complies with international norms on media pluralism and diversity immediately prior to elections. Researchers focus on a variety of sources for only a few weeks or months while the mission is in country (G. Maiola personal communication, March 24, 2015). Although the data gathered is typically robust for the period being assessed, there is the risk that problems occurring prior to the observers' arrival will be neglected.

For an example of source-limited EMM, consider the Varshney-Wilkinson data on Hindu-Muslim violence in India from 1950-1995 reported in *The Times of India,* Bombay edition (Appendix A-10). Given the biases identified in the other media outlets, *The Times of India* was intentionally chosen as a primary reputable source. This method may reduce the resources required for EMM, but in some cases this approach risks neglecting other potentially useful sources and losing key data.

For an example of an expansive EMM effort, consider the Bureau of Investigative Journalism's (the Bureau) and New American Foundation's (NAF) research on U.S. drone strikes (Appendix A-2). Both organizations seek to count the number of civilians killed by U.S. drones abroad, and they use a multitude of international, regional, and domestic sources. The Bureau chooses only "reputable national and international media outlets" as well as data from legal cases, researchers' field work, and, when relevant, academic journals, books, and papers ("Get the data: Drone Wars," 2015). The NAF's methods, similarly, rely on national wire services, regional newspapers, South Asian and Middle Eastern television networks, and news organizations with in-country coverage ("Drone Wars Methodology," 2015).

Relying on major media outlets is useful as such sources often have strong verification and review processes, in part, because of their greater need for accountability vis-à-vis widespread readers (J. Sloboda & H. Dardagan, personal communication, March 11, 2015). These outlets also have drawbacks. First, major news agencies such as Reuters, Agence France Presse, and the Associated Press sell their stories to news organizations such as the *New York Times* and *Washington Post*; thus, the news organizations often publish the stories with the same data (R. Kluver and S. Balfour, personal communication, March 26, 2015). Additionally, many news agencies are Western-based and have international correspondents in the field, introducing selection bias (see Table 1) in their choice of stories and locations. Other sources can help offset these biases. Studies show that Reuters and other mainstream sources report events not included in regional sources and vice versa. International news agencies and regional sources are supplements for one another, not substitutes (Schrodt and Gerner, 2012).

An interesting case signaling the value of local news is the Deadly Force project, which started in 2010 and tracked police shootings in Las Vegas starting in 2000 (Appendix A-9). The project compared data from

police records to data in news reports and showed that, while the local news did not miss any deadly shootings, it did under-report shootings that resulted in no fatalities or injuries. Moreover, the national news would likely have under-reported deadly shootings as local news sources report police killings national news miss.

In sum, deciding "how local to go" in selecting media sources depends not only on the existence of such sources, but also on the project's geographical scope, resources, and issue area in addition to the researcher's assessment of the media's reliability. Some EMM projects have gone to the most local level possible, monitoring citizen journalists reporting in social media. Social media introduces new challenges of monitoring and verification, and further research is necessary before including them as routine EMM sources. In many cases experts caution that a leading international or national source should be selected as the benchmark against which other sources are measured (H. Ramos, personal communication, February 19, 2015).

Developing a Coding Manual, Developing a Dictionary, and Training Coders

After determining which sources to use, the next step is to develop a coding manual, also referred to as a codebook or, for automated systems, a "dictionary." Coding manuals, codebooks, and dictionaries all perform the same function: determining and defining the information to look for in specific sources. In all cases, humans or computers define the terms of interest through several rounds of iterative research. These terms, known as variables, must be clearly defined and sufficiently broad so as to include multiple contexts and interpretations. For example, in a political violence report, researchers might look for (or tell the computer to look for) the variable terms "protest," "killed," and "clashes," among others.

In any media monitoring system, it is critical the researcher include the desired actions, actors, and contextual information, while leaving out opinions and information irrelevant to the project (Schrodt et al, 2001). Without clear manuals and dictionaries, media monitoring risks reduction to an anecdotal, inconsistent, and invalid search.

One technique to avoid this risk is to capture only the date, source, target, and action; in essence, "who did what to whom, and when." Most automated systems are built from this basic structure. Researchers can add additional details, including environmental characteristics as well as figures, names, and demographic details of victims and perpetrators. Converse to these "hard facts," other types of information require textual interpretation by a human. Manual EMM should include checks and balances as two individuals can interpret the same text differently, especially when deviating from the "who did what to whom" framework.

The design and development of coding manuals and dictionaries, which tell people or computers exactly what to look for, is crucial because it ensures consistent information gathering to draw broader conclusions. If researchers decide they want additional information partially through the monitoring process, they must revisit previously identified events as this information would not have been previously captured. One way to mitigate this concern is to think about 'living' coding manuals. For example, the Global Detention Project (GDP), which seeks to map the use of detention and other immigration control regimes, described their coding system as an "iterative process" eight years in the making (M. Flynn, personal communication, March

5, 2015). Before monitoring begins, the GDP conducts research to develop initial coding criteria for events. The GDP then continually re-evaluates its coding criteria and makes updates. When its researchers identify new categories, they recode past data to ensure consistency.

Manual coding: Developing a coding manual

Efficient and documented coding practices are important for ensuring data quality with scarce resources. According to Höglund and Öberg (2011), to achieve coding efficiency "simplicity of operationalization" is essential to decrease discretionary coding decisions. Simple, straightforward coding rules increase inter-coder reliability and consistency as coders are more apt to be uniform in their practices. For example, as shown below, coders gathering data on journalist killings must be instructed to consistently gather the same information about each incident. When a coder must use his or her own discretion, unsystematic errors become an issue. Thus, a clearly written codebook with procedures for difficult coding decisions allow for more inter-coder reliability (Höglund and Öberg, 2011).

Table 2 offers examples of variables in coding manuals for two different events.

Table 2. **Codebook Variables For Real-Life Cases**

Case: Database of journalists killed, Committee to Protect Journalists (1992 onwards)
Event: Journalist killing
Variables

☐ Name	☐ Country	☐ Year
☐ Medium	☐ Beats covered	☐ Gender
☐ Local or foreign	☐ Freelance	☐ Type of death
☐ Suspected source of fire	☐ Impunity	☐ Taken captive
☐ Tortured	☐ Threatened	

(Table continues on next page)

Case: Varshney-Wilkenson codebook, Ethnic Violence in India Media Project (2004)

Event: Episode of ethnic violence

Variables

☐ Detailed Time & Location	☐ Killed	☐ Injured
☐ Arrests	☐ Source Dada, Reported	☐ Duration of Riot, Source (Media Outlet)
☐ Cause, Local Event that Precipitated the Riot	☐ Link to Outside Event (if existed)	☐ Officials Stationed
☐ Officials Suspended or Transferred during or after the Riot	☐ Reports of Police vs. Single Group during Riot	☐ Reports of Dalit vs Muslim Violence during the riot
☐ Type of Police Presence	☐ Coding Question	☐ Probability
☐ Reliability	☐ Notes	

Note: Generally manual codebooks will have an explicit definition of each term in a column next to each variable. Additionally, variables may have shorthand codes (e.g. ActGen for Actor's Gender) in an additional column to speed up the manual coding practice.

Language considerations are also important when creating codebooks. If the EMM search includes non-English news sources, researchers must develop additional codebooks for each language and ensure appropriate translation of variables. Information in other languages can be utilized as a signal to the researcher. For example, when researchers at the GDP come across media in a language no staff member knows, they learn key words in that language to appropriately search within the available text (M. Flynn, personal communication, March 5, 2015). This initial identification of key words can be a trigger for further investigation.

Training coders

In manual EMM, data quality depends on the aptitude of the coders. Effective coder training reduces bias and increases data accuracy. Reliability tests can be conducted among coders over time to verify findings, such as inter-coder reliability tests: multiple coders independently go through the same document, compare the results, and check for deviations.

Supervisors may also perform random or interval checks to verify coding consistencies. If results vary, coders or project supervisors should discuss variations to identify a common interpretation moving forward (S. Golden, personal communication, April 7, 2015). Time reliability tests are another method for boosting coder accuracy; supervisors assign a coder to analyze an article, and then repeat the process some time later, verifying consistency.

Automated coding: Developing a dictionary

The Phoenix off-the-shelf EMM system uses a "date-source-target-action" structure, or "who did what to whom, when." Phoenix was developed for international relations event data and is predominantly oriented towards such events. Nonetheless, Phoenix is trying to generate more comprehensive coding schemes, including nation-states as actors, political parties, NGOs, rebel movements, and civilians.

To develop a customized system designed to pick up actions related to specific violations, HRW could work with a private company or scholarly group (See Appendix B-4).

Automated systems require dictionaries that tell the computer which words are associated with each action or actor code. When the computer processes a story containing those terms, it picks them up as event indicators. Dictionaries are created through trial-and-error processes in which a human monitors the automated system as it processes a number of test sentences. If the computer makes an error, the human coder adds new terms or corrects the terms until the automated system attains the desired level of accuracy. At times, the codes representing variables are less explicit than codes found in a manual codebook, but their definitions can be found in the dictionary (e.g., automated system Phoenix codes Human Rights Watch as [inNGOHRI]!).

Dictionaries are crucial in determining the utility of an automated EMM system. The limitations of these systems do not come from the sources they use but rather from the scope of their dictionaries. Even if the automated system scans a large number of sources, it will not yield precise results if the dictionary is not sufficiently accurate to pick up all relevant events and exclude irrelevant ones. Phoenix's dictionaries are very detailed (see Appendix B-1 for examples), but they are not country-specific because the project has a global focus. That is, Phoenix did not develop the dictionaries with a specific country or conflict in mind; it was created to pick up the same types of events for all countries equally.

Customized country or conflict-specific dictionaries can be developed relatively quickly. Due to widespread interest in the Islamic State of Iraq and the Levant (ISIL), for example, Phoenix added the names of the group's most prominent members and subgroups to its existing dictionaries (see Appendix B-2). As a result, the expanded dictionary system was able to pick up 1,503 additional events compared to the previous generic dictionary. Moreover, researchers are developing new dictionaries tailored for Mexico and Central America, which would include the names of domestic political actors.

Even if the automated system can extract text from news sources in multiple languages, it will still be unable to code the text if its dictionaries are only developed in English. Academics affiliated with the project are currently working to expand dictionaries to other languages such as Spanish and Arabic.

Gathering Data

Researchers must look at the quantity and quality of information produced by a given source as well as its temporal scope; the latter determines whether researchers will use real-time or archived sources. Source selection is a crucial difference between automated and manual systems. Automated EMM can only extract information from sources included in the system, while manual EMM projects have more discretion and flexibility.

Google Alerts can facilitate manual EMM for certain search terms, notifying the researcher every time the term appears in a news article. An RSS (Rich Site Summary) feed aggregates blog entries, news stories, and other online publication in real-time. Researchers may also directly monitor a select number of publications, allowing researchers to catch relevant stories that do not use the keywords specified in Google Alerts and RSS feeds. The central issue with setting up these types of notifications is attaining comprehensiveness without producing an unmanageable amount of alerts. A useful example comes from Philip M. Stinson's work on police misconduct in the U.S., its database including incidents of officer arrests since 2005. His data-collection process relies on 48 Google Alerts for generic incidents; each time Stinson detected an arrest for police officer misconduct, he would set up an additional alert for the officer's name, allowing him to track that specific case's development over time. Stinson's project has been praised as the most reliable effort at the national level so far, including up to 11,000 cases involving some 9,000 officers. This project is an immense effort; at the moment, Stinson's team includes two graduate and ten undergraduate students, each working six to ten hours a week. At times, Stinson had eight graduate assistants working 20 hours per week. The overabundance of data is difficult to analyze given the project's resource constraints. Stinson acknowledges that the number of cases is so high that, for now, the project is mostly trying to build a database for later in-depth recoding once more resources are available.

Another method of gathering data is the Media Monitoring System (MMS) program, developed by Raytheon-BBN Technologies and hosted by Texas A&M University with support from the Combatting Terrorism Technical Support Office of the United States Government. MMS is comprised of the Web Monitoring System (WMS) and the Broadcast Monitoring System (BMS). WMS translates eight languages, including Arabic, Chinese, and Farsi, among others; the Arabic translations, at this point, are the most accurate at 95%. WMS pulls from major newspapers in these eight languages, permitting researchers to search the newspapers with key words. BMS ingests, transcribes, and then translates broadcast media content from five foreign languages. MMS is a credible way for researchers to search news sources outside major English-language news outlets (R. Kluver and S. Balfour, personal communication, March 26, 2015). Researchers based outside academic institutions, however, must pay to use this system.

All of the aforementioned manual EMM tools are employed for real-time news data, which is useful when researchers cannot physically access a geographic area of interest. Still, it is likely that many real-time reports will contain inaccuracies. When EMM projects rely on historical data to discuss a single event over time, they can use non-media sources for triangulation. In addition, news stories may revise their data over time. For example, Dr. Raheel Dhattiwala; who researched ethnic violence in Gujarat, India in 2002 using *The Times of India*; claims that NGOs, including HRW, over-estimated deaths from ethnic violence (R. Dhattiwala,

personal communication, March, 14, 2015). Victims, witnesses, and civil society groups were unable to provide accurate figures in the immediate aftermath of the violence, according to Dr. Dhattiwala. Over time, however, better data became available, and they were later reported in *The Times of India* (see Dhattiwala and Bigg's article, linked here).

Coding news stories

Coding is the process by which researchers transform raw data collected from media sources into meaningful categories based on a conceptual scheme, or dictionary, determined by project leaders (Babbie, 2015). Researchers generate event data by extracting only that information required by the coding manual/dictionary.

Figure 3 provides a hypothetical example of how a manual EMM coding process could be used to detect instances of kidnappings by Boko Haram in Nigeria.

Figure 3. **Coding EMM Example**

Figure 3 show what a manual EMM coding process would look like to detect instances of kidnappings by Boko Haram in Nigeria, article retrieved from http://www.nigeriasun.com/index.php/sid/224813143.

The researcher would have already defined which information would be extracted for each event. If only date, location, fatal victims, and individuals kidnapped were needed, then the researcher would have extracted that information from the report and transferred it to a database. This would transform the report in Figure 3 into a single event that looks like the example that appears in Table 3. In an automated EMM system, the computer is programmed to scan news sources to gather the same data.

Table 3. **Transferred Coded Data Example: Borno State**

Date	Location	Fatal victims	Individuals kidnapped
08/11/2014	Borno State	28	97

Manual coding

In manual coding, the researcher applies the EMM codebook to each media source and tracks the information in an Excel spreadsheet or other database program (S. Golden, personal communication, April 7, 2015). Practitioners regularly organize data by event to compare figures across sources for each event. There are challenges to this approach; for example, scholars have criticized the Iraq Body Count (IBC) for "under-matching," or listing incidents as separate when they are actually the same, and "over-matching," or listing incidents as the same when they are, in fact, different (Ball and Price, 2014 and Spagat, Mack, Cooper, and Kreutz, 2009).

Coding can also be compromised by inconsistent data reported by a variety sources regarding the same event. Researchers often use the most credible source to reconcile inconsistent figures from separate sources reporting the same event, justifying their choice in a note. In other cases, projects use the lowest figure available to limit over-reporting. Dr. Dhattiwala's research on the Gujarat killings, for example, used a combination of both of these practices (see Appendix A-10). Alternatively, researchers can use a range rather than a single figure for data counts. For example, the IBC project publishes a range of casualties for incidents with inconsistent casualty estimates across reputable sources (J. Sloboda and H. Dardagan, personal communication, March 11, 2015).

According to Sabine Otto (2013), when coding for one-sided violence (See Appendix A-6), it is often challenging to decide who the perpetrator is; in 47% of articles on one-sided violence presented by Uppsala Conflict Data Program Georeferenced Event Dataset (UCDP GED), the perpetrators were "unknown" in the dataset but coded as the Taliban. The decision to code these perpetrators as such may be based on the coder's previous experiences and knowledge, but this could also lead to greater bias.

Another example of mismatched data comes from the work on drone strikes and killings by the Bureau and the NAF. To verify the number of drone strikes and killings, the two organizations cross-reference their data with each other and other sources. The Bureau, however, classifies a "strike" as "a missile or set of missiles fired in a single location in a short time window" ("Get the data: Drone wars," 2015). According to the Bureau, a "short time window" includes multiple hits within a single hour. When the hits are more than an hour apart or "a couple of miles apart," the Bureau counts them as separate events ("Get the data: Drone wars," 2015). The NAF, on the other hand, classifies strikes as "single events" when hits occur in one area in less than two hours ("Drone wars methodology," 2015).

In addition, the NAF and the Bureau label militants differently. The Bureau uses the term "militant" for anyone who is part of "organized, named groups that bear arms and that are not part of Pakistani, Somali, or Yemeni military, policy, paramilitary or militia forces" ("Get the data: Drone wars," 2015). For the NAF, however, a person is a "militant" only if two or more credible sources classify the person's group in that manner. Thus, while both the Bureau and NAF rigorously cross-reference their data with that of other organizations, their varying interpretations of "strikes" and "militants" yield different results.

All of the above-mentioned examples take into account a very important aspect of EMM: verification. Data and coding transparency enhance verification. Multiple sources, including IBC and Varshney-Wilkenson, have noted the importance of transparent data during and after the coding process. Given the inherent bias in media data, public input on figures provides opportunities for stakeholders to challenge or validate the data. IBC data is publically available for feedback, and this has greatly improved the data's validity, according to IBC founders John Sloboda and Hamit Dardagan (personal communication, March 11, 2015).

Automated coding

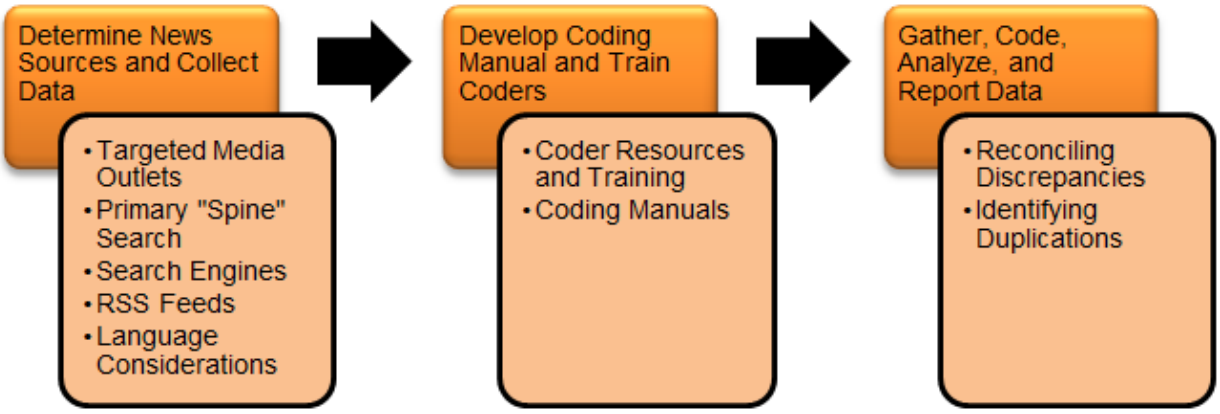
Open-source automated systems produce large datasets of all events listed in the dictionary for a specified time period. This presents two problems. First, the system is likely to pick up irrelevant events; for example, the computer might code the headline "Portugal destroys Spain" as an event of interstate aggression when it is actually a sports article. Secondly, the system may duplicate some events, not only because more than one source reports the same event, but also because of the way in which news wires produce reports. For example, Reuters may report a bombing in Baghdad in real-time but then later publish additional reports about the same event while adding further details. Phoenix attempts to deal with this by allowing only one unique source-target-action combination per day. Although this ensures that there are no duplicates in the daily files, there will be duplicates if wires or other sources report on the same event on multiple days. These problems are not insurmountable, but researchers will need to know how to "clean" the data by extracting only relevant events. Phoenix's output includes the URLs for each story, helping coders check whether the event is unique and germane.

Due to its global focus, Phoenix's scope of news sources and the precision of its dictionary are reduced in favor of providing worldwide coverage. Phoenix, therefore, will never be ideal for automated EMM research on any particular country or conflict. As noted above, HRW can customize the process to a specific country, conflict, or type of violation by building partnerships with a university or private company.

Recommendations

EMM can help HRW identify, track, and analyze human rights violations, especially given new technological advances that allow for greater and more accurate automation. HRW can incorporate EMM into any or all of its ongoing projects, but it must make a meaningful commitment of time and resources.

Figure 4. **EMM Protocol**



In this section we provide recommendations that correspond to the different stages in the EMM process, demonstrated in Figure 4 above. We start with higher-level recommendations, which apply to both manual and automated EMM, and then consider each method, in turn.

Evaluate media sources in relation to other sources (triangulate): News stories are prone to methodological biases, and available news sources may not always report on events of interest. HRW should continue to supplement all EMM efforts by triangulating with other data sources, including field interviews, hospital records, and reports from local service providers. When triangulation suggests that the EMM data quality for a specific project is poor, researchers should focus on other methods.

Consider whether there is room for improvement: HRW cannot improve the quality of news reporting, but it can alter its EMM practices. If HRW is dissatisfied with the quantity of data obtained through EMM, it should determine whether the problem is the news sources themselves or its EMM practices. If the latter problem, HRW can invest resources to evaluate and modify its practices until the results match HRW's project goal.

Think of media monitoring as an "eye-in-the-sky:" Media reports are valuable sources of real-time event data but are not the best source for fine-grained event details or qualitative reporting on the human impact of an event. Researchers should not expect to get more than the "hard facts" in real-time news; "the who, what, and where" of a given event; and an aggregate of those facts over time. Used this way, EMM can establish baselines and trends, facilitate cross-national comparisons, and identify events worthy of further investigation.

Define the event of interest: If the identification of an event as a "human rights abuse" requires contextual information, EMM may be unhelpful on its own. For example, Boko Haram's civilian kidnappings are considered human rights violations independent of context whereas some events are only considered violations under certain conditions, such as deadly police shootings in the United States, which require supplementary context regarding police misconduct. Researchers should evaluate if EMM would provide the necessary contextual information in cases such as the latter or if complementary sources are required and available. This is a major consideration in the initial decision to use EMM.

Assess the media environment in given locations: EMM is problematic when there are too many or too few electronically available media sources. Too many sources will lead to underreporting, or omission bias, while too many sources will produce an unmanageable amount of data. These two problems require distinct approaches such as more rigorous triangulation or committing more resources.

Judge the value of media monitoring in relation to temporal scope: If researchers need to track unfolding events, EMM may be the best available option. If real-time information is not required, HRW should consider whether EMM adds value. The researchers may be able to consult other sources, such as hospital records, local NGOs reports, testimonies, official documents, inquest findings, and more. HRW should assess EMM's value in comparison to these alternatives.

Value transparency: HRW should always clearly report its data gathering procedures. Each decision made during the monitoring process has implications for the data and may introduce new problems while solving others. To boost accuracy, provide accountability, and facilitate discussion, HRW must always make its sources explicit along with its coding/search methods.

Manual media monitoring

Choose Source

Identify a "spine" source: Howard Ramos of Dalhousie University uses the term "spine source" to describe the single most reliable news source in a country or region. Researchers should regularly search and code this source for relevant data, using information from other sources to fill in gaps or resolve discrepancies. This is only feasible when a highly credible news source interested in the issue and geographic area already exists.

Consider setting up Google Alert on RSS feeds: Every news website has an optional RSS feed, which can be updated in real-time through free software like Inoreader or QuiteRSS. These are more complicated than Google Alerts to create, but they allow users to specify sources (which Google

Alerts does not). Applications such as FeedRinse or FeedSifter can help filter and limit the RSS feed. As in any search, users should limit the number of sources and keywords to a manageable flow.

Keep in mind language considerations: Local non-English language sources report events that may not be covered by larger English language news outlets, but they may also be more biased. Consider working with Media Monitoring System (MMS), a media monitoring system that accurately translates media sources in multiple languages, to access and search certain foreign language reports. Additionally, using MMS will allow access to broadcast news from the around world through its Broadcast Monitoring System (BMS) program.

Test alternative strategies during the initial period: Changing collection strategies during media monitoring reduces data validity and requires researchers to re-do prior searches to ensure consistency. However, it may be worthwhile to test alternative strategies during an initial trial period using Google Alerts, RSS feeds, and automated coding efforts to see which is best suited to the task at hand.

Develop coding manual and training coders

Coder resources and training: Entry-level staff or interns can be effectively trained as coders, but, as each person brings her own perspective, their work should be checked intermittently through inter-coder reliability tests, discussed in Appendix D.

Coding manual: Researchers should develop a coding manual for each project that includes clear definitions of the variables as well as instructions on what to do in unclear or conflicted coding situations. The codebook should be a living document, updated as more information becomes available. When adding new variables researchers should re-code the earlier data.

Code, analyze and report data

Reconciling discrepancies across sources: HRW should document how it handles coding discrepancies in each specific project. If HRW chooses one figure or source over another, it should explain this in a note. As in the case of HRW's Boko Haram project, it is often advisable to use the lowest reported figure. Comparing figures across sources is good practice when they do not draw their data from one other or from the same third source.

Check for duplicates and close-duplicates: This is likely to be a problem when more than one individual is involved in gathering event data. A duplicate event is a repeat of the same event; close duplicates are events with small variations, such as in the number of victims or in the precise event location, making it difficult for the researcher to discern whether the reports are covering two distinct events or the same event. If one of the sources is misreporting data on the same event or if there are two sources reporting on two distinct events, rules should be developed to define and

exclude close-duplicate data. If the event is determined to be a duplicate, the team should take out data from the duplicated event.

Automated Media Monitoring

Consider each method in comparison to feasible alternatives: Manual coding is superior to automated coding insofar as the researcher controls information access and processing. At the same time, manual coding of multiple sources is highly labor intensive. The researcher must ask, "How feasible is it to monitor the relevant sources each day given my existing resources?" Human eyes and minds are better able to interpret text and extract information, but there is a limit to how many stories individuals can feasibly read, process, and code in a given amount of time.

Assess the utility of the coding system for research needs: In automated coding, HRW will have to either develop its own customized coding system or work with open-source systems. As previously mentioned, the Phoenix project relies on the CAMEO codebook. The events included in CAMEO are limited, and many may be irrelevant to HRW's work. Researchers should examine CAMEO when preparing a research project so as to assess Phoenix's utility.

As currently structured, Phoenix-type systems are most useful for monitoring events globally or across multiple countries in real-time. Phoenix is less suited for projects focused on specific event types or countries, as it will likely miss some cases and overstate others. Phoenix has limited information on any single event. Moreover, single event monitoring in Phoenix is prone to reporting and coding errors.

Nevertheless, Phoenix has low startup costs and is easy to replicate for different projects. Phoenix's ability to cover more obscure countries and events will increase over time as its news sources expand in number and languages. HRW should consider familiarizing itself with Phoenix and exploring its applicability to specific projects.

Leveraging Resources and Further Research

Look for staff and/or interns with basic programming skills: To work with Phoenix, staff require basic coding skills in R, a free and widely-used statistical software. Once the R code is set up for a given project, it can be adapted and replicated by changing the actor and action codes. For example, switching from reports on "rebel kidnapping of civilians in Nigeria" to "Israeli military arrests of Palestine civilians" requires replacing the actor codes "NGAREB" with "ISRMIL,"

"NGACIV" with "PALCIV," and replacing the action code "181," used in Phoenix for "kidnappings," with "173," the Phoenix code for "arrests."

Collaborate with universities: In automated event data, start-up costs rise as flexibility increases. In other words, the more customized the automated EMM project, the more HRW needs to invest. If HRW is interested in tailoring automated systems to specific project needs, it should consider creating mutually beneficial partnerships with university-based graduate students or faculty. Departments of political science, sociology, communications, and others in research-oriented universities all have students and faculty with R coding skills and relevant research interests.

Additional Ways to Use Media Monitoring

HRW could use content analysis in media monitoring to track the efficacy of advocacy efforts. For example, researchers could code over-time coverage of violence against LGBT persons in Russia, considering both the number of reports and the style of reporting, as evidence of human rights impact (or lack thereof). For example, do the same Russian media sources increasingly disapprove of such violence? Do they increasingly label such events as "violations of human rights?" These, and many other indicators, can be tracked as possible evidence of over-time advocacy impact. More information on this type of media monitoring is included in Appendix A-8.

Appendix

Appendix A: Case Studies

A-1. Election observation

International and domestic election observers regularly use EMM to assess media coverage of election campaigns, which can help, along with other information, to determine the extent to which incumbents uphold freedom of expression and the press. Organizations that regularly use media monitoring in this way include the Organization for Security and Cooperation in Europe's Office for Democratic Institutions and Human Rights (ODIHR), which has created its own, detailed, media monitoring handbook.

Monitoring missions typically create a media-monitoring unit that includes a media analyst and a national support staff to assist with collection, translation, and interpretation of data. These units typically use manual systems in which human analysts select the sources and time frame as well as code the data. Variables include the minutes/inches/words devoted to particular candidates; number of positive, negative, and neutral references; and gender balance in coverage. Monitors do additional qualitative analysis to examine journalistic style.

Although this process is oriented towards evaluating the media's conduct rather than tabulating events, its careful development of codes and analytical procedures is relevant to EMM. As is true for HRW, media monitoring is only a small component of the mission's overall effort and always supplemented by other information.

A-2. Drone strikes and fatalities

The Bureau of Investigative Journalism (the Bureau) uses media monitoring to track U.S. drone strikes in Pakistan, Yemen, Somalia, and, as of February 2015, Afghanistan. The New American Foundation (NAF)'s International Security Program also counts drone strikes in Pakistan and Yemen. Both the Bureau and NAF also count drone strike fatalities.

The Bureau uses international, regional, and local news outlets, NGO reports, and other sources. Examples include CNN, the Guardian, Time, Fox News, Al Jazeera, WikiLeaks, the UN, Human Rights Watch, and Al Akhbar. The NAF uses international wire services such as Agence France Presse, the Associated Press, and Reuters; regional newspapers such as the Yemen Observer and Dawn; and Western media sources with in-country coverage such as the BBC, CNN, New York Times, and the Telegraph. Both the Bureau and the NAF cross-reference their counts with each other and with other organizations.

When counting and coding drone strikes, the Bureau gives each strike a unique code comprised of a number and a letter. For example, Ob21 uses "Ob" to distinguish the strike as occurring the Obama presidency (B would be a strike during the Bush years); "C" in the code means a single source reported on the strike, and

that it may, or may not be, a drone strike; "0" in the code means it was a non-lethal U.S. drone operation; and "SOM" indicates that the strike took place in Somalia. (The NAF did not provide similar coding information).

Both the Bureau and the NAF report the lowest and highest numbers of reported deaths for each strike. To add a drone strike to its database, the NAF requires that at least two credible sources verify the strike, although it aims for four credible sources per strike. To create consistency in counting and coding, the NAF and the Bureau create specific definitions for what counts as a single drone strike and who is coded as what (i.e. civilian, militant, women, children, etc.). For example, to be considered a single strike by the Bureau, it must be a "missile or set of missiles fired in a single location in a short time window" or less than an hour apart. To be counted as separate strikes, the strikes must be more than a "couple miles apart." The NAF has a similar system but uses slightly different criteria: a single strike could be multiple strikes occurring in one area two hours or less apart. When an article provides ambiguous language, the Bureau states there were "possible civilian casualties" in the timeline and figures for that strikes. In defining "children" as victims, the Bureau uses the UN definition of persons aged 0-17 years, inclusive, whereas the NAF defines a victim as a child if two or more new sources report the person/people involved as "children."

A-3. Syria: Reporting the Red Line

"Reporting the Red Line" is a project of the Columbia School of Journalism that analyzes media coverage of chemical weapons use in Syria in the eight months prior to the August 2013 Ghouta attack. The project's goal was to identify how mainstream media (both international and in Syria) and reporting from citizen media/media monitoring groups impacted the discourse on international military intervention in Syria. The Assad government suppressed the local press, leading to the rise of Syrian citizen reporting groups. Mainstream international and Syrian media outlets were more restrained in their coverage than the citizen groups both because they had been repressed by the Syrian regime and because they feared unverified reports would be used to justify military intervention.

Using the Global Database of Events, Language and Tone (GDELT), researchers tracked mainstream media coverage of events in Syria from December 12, 2012 through November 1, 2013. The researchers used the database to track the number of stories published each day on events in Syria, mapping periods of high and low coverage. The project also developed a list of citizen-generated social media stories on 12 alleged instances of chemical weapons use prior to the Ghouta attack, drawing on information shared on YouTube, Twitter, and other social media.

The researchers argue that incidents of alleged Syrian chemical weapons attacks were not well covered by the mainstream media, which preferred to focus on more easily verifiable events. It was not until after the August 21, 2013 attack in Ghouta that mainstream media coverage of chemical weapons attacks spiked, peaking on August 30, 2013 when President Obama stated his belief that chemical weapons had been used in Syria.

This project highlights the gap between events and reporting as well as the importance of using additional sources outside the mainstream media, which was constrained from covering events. Citizen journalists

became a critical source on Syria and should be carefully scrutinized in the future in other locales when mainstream media are similarly constrained.

A-4. Iraq Body Count

The Iraq Body Count (IBC) records violent civilian deaths resulting from the U.S.-led military invasion in 2003. The founders of this non-profit project created the project to "ensure that the human consequences of military intervention in Iraq were not neglected" as they had noted the lack of available information on civilian deaths (IBC website).

The project's creators went on to found Every Casualty, a recognized UK charity that works for "a world where no casualty of armed violence is left unrecorded" (Every Casualty website).

The IBC project draws its fatality data from crosschecked media reports, supplemented by hospital, morgue, NGO, and official figures. IBC's sources are primarily English, under the assumption that international wire services are more credible than Iraqi sources. All IBC calculations are reviewed by at least two team members, and each incident or death is bolstered by at least 18 different pieces of information. The IBC relies only on manual EMM, and, while flawed, is one of the more respected projects of its kind.

IBC uses standardized indicators to tag incidents for date, time, place, targets, demographic data (available for one third of the deaths), and weapons. This database distinguishes entries and reduces double counting, yet IBC uses a min-max system to report uncertainties, using "0" for the possibility that the incident is already counted in the database and "1" for the possibility the incident is unrecorded in IBC's database (Danchev and MacMillan, 2005, p. 221).

IBC retrieves only factual data and continually consults and updates its figures, noting changes and making data publically available. It has been able to identify the names of roughly 9% of its casualties, which it believes to be a substantial accomplishment (J. Sloboda & H. Dardagan, personal communication, March 11, 2015).

Critics Ball and Price (2014) claim IBC's data suffers from event size bias, meaning larger events with more casualties disproportionately receive more media coverage. IBC's founders, however, say 80% of their reported incidents have three or fewer deaths, which is evidence of their commitment to documenting smaller incidents (J. Sloboda & H. Dardagan, personal communication, March 11, 2015).

Ball and Price (2014) also argue that IBC has overly conservative "matching" rules, leading to an over-estimate of "duplicates" and an under-estimate of fatalities. Spagat, Mack, Cooper, and Kreutz (2009) note that IBC's "passive surveillance" techniques tend to under-report deaths while population-based surveys tend to over-report. IBC founders John Sloboda and Hamit Dardagan (personal communication, March 11, 2015) make no claims about deaths not included in their data.

IBC's exclusive reliance on international media likely leads to casualty underreporting. Additional practices worth noting include IBC's commitment to name those who have died (when possible), update and re-analyze data constantly, make data publicly available to allow for others to test its validity, triangulate information with non-media sources, and use a minimum of two independent analysts for each event.

Every Casualty is nearing the end of a three-year project to create common standards for casualty counting. The document will be available for feedback in Fall 2015. A draft of the report's section headings is available online here.

A-5 Mapping Nigerian kidnappings with GDELT

FiveThirtyEight, a data journalism site, uses statistical analysis to tell compelling stories on a wide variety of topics in current politics and political news. The site, known for predictive models, conducted automated EMM to track and map Boko Haram initiated kidnappings in Nigeria. The automated EMM project used the Global Database of Events, Language and Tone (GDELT) to describe Nigerian kidnapping trends from the early 1980s to the present. The GDELT database, which stretches back to January 1979, consists of more than a quarter-billion geo-referenced event records in over 300 categories. The database translates media reports into codified records, which include actors, locations, organizations, themes, sources and behaviors such as protests, deportations, assassinations, and kidnappings.

Given Nigeria's ranking by Transparency International of 144 out of 177 on transparency and anti-corruption policies, the writers of FiveThirtyEight chose to use GDELT over Nigerian National Crime Statistics to identify discreet kidnapping trends throughout Nigeria's contemporary history. The study reported 2,285 kidnappings in Nigeria and showed the average daily kidnapping count to be significantly lower between the years 2000 and 2009 than during the first four months of 2014. For example, on April 14, 2014—when Boko Haram claimed responsibility for kidnapping school girls in a small northern Nigerian town—the study recorded over 151 kidnappings in Nigeria for a single day. (See Figure A-5)

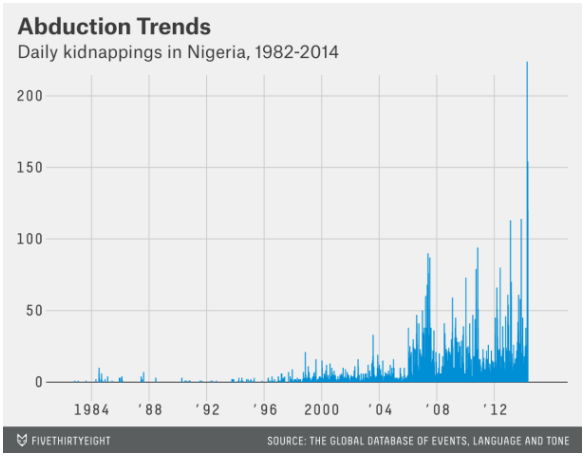


Figure A-5. Abduction Trends

This study is criticized for painting an inaccurate picture about Boko Haram's operations and kidnapping trends in Nigeria. Critics point out databases such as GDELT simply aggregate events based on news reports and should take into account the increase in news stories, which generate the data.

Event databases such as GDELT count media reports of kidnappings as opposed to actual events of kidnappings. Thus, if multiple reports refer to the same kidnapping in various ways, GDELT records the single event as multiple events rather than as the single occurrence of the event itself. Further, automated

catalogs such as GDELT are susceptible to proximity bias (see Table 1) in international media reporting; therefore, assessing the media environment of the region is critical in understanding if an event from a particular region is likely to be over- or under-reported. In the case of kidnappings in Nigeria, GDELT captured data only from international media reports where the natural language processing that reported geo-location defaulted to the central Kaduna state of Nigeria. Data-poor regions such as northern Nigeria were not captured even though the violence in that region was much more prevalent.

Human rights organizations that use aggregated quantitative data to raise awareness of violence need to understand the limitations of using large event datasets such as GDELT to provide numerical accounts of violence. The aggregated information is only as good as its sources (news media reports).

A-6. One-sided violence: Coding with media bias

Coding event datasets on one-sided violence from media reports proves challenging due to various biases that must be mitigated during the coding process. Sabine Otto, PhD student at University of Konstanz, thoroughly analyzes these challenges using the Uppsala Conflict Data Program Georeferenced Event Dataset (UCDP GED).

Otto focuses on two major types of biases affecting coding: selection and description. Selection bias defined as "selectivity of event reporting by newspapers and news wires." The consequences of selection bias are proximity bias and significance bias. Description bias is "the veracity and the completeness of a reported event," and omission bias and source bias are consequences of description bias.

Given news reports only represent a subsample of the population being reported, significance bias plays a part in who and what gets reported, ultimately affecting what data is coded. For example, from her analysis of all one-sided cases in UCDP GED, Otto found that in 64% (35 of 55) of one-sided violence cases in UCDP GED, reported victims were people of public interest such as politicians. The other 36% of cases recorded "ordinary people killed in a private setting." This demonstrates civilians of public interest are more likely to be reported than people who may be unknown.

Proximity bias affects one-sided violence in that larger areas, such as provinces, are used more than exact locations in media reports. According to Otto, 31% of news articles coded by UCDP GED provide a precise location (town/village name or a limited area in a specific location), but it is near impossible to know whether cases come predominantly from urban or rural areas. Thus, this limits research on one-sided violence.

The coding process is also affected by omission bias. In order for UCDP GED to code for one-sided violence, intentionality must be present. That is, it must be clear the intention was to target civilians and that they were not killed as bystander or caught in crossfire. Yet intentionality and the identity of the perpetrator may not be covered in media reports. Otto found "in 47% of all one-sided violence cases coded by UCDP GED the perpetrators were unknown, but the Taleban [sic] was coded as the responsible party." In other cases, multiple articles covering the same event may state perpetrators as "unknown" whereas other, separate articles may state the perpetrator is, for example, "Taliban" and get coded accordingly. Thus, the coding

decision is made at the discretion of the coder and her experience, potentially resulting in omitted information. As this discretionary decision-making will introduce more bias, it should be flagged immediately.

Otto addresses the fact that these coding challenges are not a result of the news sources distorting information. Instead, they are a result of transforming news into event data for analysis. In order to mitigate bias, the codebook should have clear guidelines when a coder encounters uncertainty and unclear documentation. Additionally, Otto advises to mitigate bias by avoiding very complex definitions for codes; although this may decrease precision, it may help to match coding definitions with empirical data.

A-7. Views to a kill: Exploring the implications of source selection in the case of Guatemalan state

There is a considerable variation in reporting between newspaper-based event data and government or NGO reporting on violence. The way in which a story is reported depends on the political context of the observer or information provider. Using 17 newspapers, 5000 eyewitness interviews, and documents from non-governmental organizations (NGOs) between 1977 and 1995, Davenport and Ball compare the variations in reports of state repression in Guatemala. They find significant variations in reporting depending where observers are situated, how they collect information, and the objectives of the organization with regard to the complied data.

Newspapers focused on reporting recent disappearances and killings in urban environments, human rights organizations on reporting large numbers of killings throughout the country, and interviews on recent disappearances in rural environments. Human rights organizations were less likely to report secretive violations, such as disappearances, and concentrated on documenting obvious large-scale violations. Interviews or eyewitness accounts offered more detail about the violation, highlighted the perpetrator, and provided detail accounts of the violation.

Newspaper data suffers from source bias as news agencies do not report all events. Some events are seen as 'newsworthy' by the news agency and, thus, more likely to be reported. An event's newsworthiness depends on the proximity of the event to the news agency, the size of the event, and the intensity of violence at the event. Additionally, the sample of events on which newspapers report is structured by various factors such as event characteristics, reporting norms, news agency characteristics and editorial concerns. For instance, newspapers in Guatemala avoided controversy and reported more human right violations when they perceived the government to be more democratic in nature.

Conversely, newspapers are easily accessible and provide a complete account of events for the widest sample of geographical units. Newspapers also offer a more objective and comprehensive coverage of violent events than human rights reports or eyewitness accounts; additionally, their event data are a useful source of information to study patterns and processes of political violence. Newspapers' interest in reporting the "news" usually meant communicating relevant information such as time, date, and identification of victims and perpetrators.

This case addresses the application of multiple-source analysis for political conflict or human rights violations as essential to strengthen the accuracy of event data analysis. It is critical researchers be transparent regarding the sources used and their limitations. To mitigate some of the biases of newspaper event data researchers should consider contextual factors such as geographic categories and democratic settings of a regime. Furthermore, combining sources can help to mitigate the specific bias of a particular news agency through a more representative sample of actual events.

A-8. Media monitoring for advocacy analysis

Media monitoring can alternatively be used to analyze and monitor the human rights landscape in a target local context. This topic is outside of the scope of event-based monitoring of violations; however, we believe HRW could benefit from researching this topic further. By analyzing, monitoring, and mapping local media frames, HRW could track the efficacy of their efforts in certain human rights areas. Here we present a few case studies, highlighting work being done for advocacy to consider how qualitative media monitoring could contribute to HRW's advocacy initiatives.

Global Media Monitoring Project: The Global Media Monitoring Project (GMMP) partners with hundreds of groups every five years to monitor one day in the media. This media monitoring provides a snapshot of how women and issues of gender equality are represented in more than 100 countries. GMMP publishes a report noting both quantitative and qualitative findings from this single day of monitoring (S. Macharia, personal communication, April 15, 2015). For example, in 2010 the project reported slight progress in the proportion of news stories highlighting issues of gender equality or inequality compared to five years ago (GMMP, 2010). GMMP provides coding materials and guidance to volunteer partner groups in addition to training for GMMP regional coordinators. Country and regional workshops are also held under the National Coordinator with technical support from GMMP (a number of the coding tools and self-administered tutorials are available publicly on their website). This model and the chosen tools could be applied and adapted for HRW regional offices to gain qualitative information about how a targeted human rights topic is covered in local media sources.

Building Bridges Case Study in Great Britain: Building Bridges is a practical guide to understanding and engaging with values, such as "safety" or "social justice," and frames, such as "defend British democracy" or "increase cost," in human rights discourse (Equally Ours, Counterpoint and the PIRC, 2015). Since values can be activated or suppressed based on how an issue is framed, it is important the researcher understands if the framing is promoting or undermining the human rights issues of interest (Equally Ours, Counterpoint and the PIRC, 2015). This approach to analyzing values within each frame could be applied in a HRW context through qualitatively studying public discourse in media. A guide from this project with examples on using human rights frames to communicate equality and social justice is available on their webpage linked here.

Gordon and Berkovitch Case Study in Israel: Gordon and Berkovitch (2007) conducted a case study on human rights discourse in the Israeli media to analyze how domestic and international human rights discourses interact with and influence each other. They noted if, how, and when social problems or events were and were not identified as human rights discourse in a major Israeli daily newspaper during a period of fourteen

years. In the discourse, the term "human rights" has the power to interpret a problem as an intolerable human rights violation as opposed to a more general social problem (Gordon and Berkovitch, 2007). Only social events that could be considered a human rights violation were included. The authors stress interpreting human rights language as rights dialogue can also be used to promote oppressive policies, for example leaders may invoke rights discourse to promote their own agenda instead of furthering a human rights cause. This type of discourse analysis could be used to gain more information about historical trends; for example, this case study was able to pinpoint when the term "human rights" surged after the Intifada.

HRW could conduct similar analyses in countries of interest to gain information about the landscape of human rights discourse and monitor how HRW activities are contributing to a change in the discourse.

A-9. Police killings

In 2010, journalists from the Las Vegas Review-Journal reviewed two decades of data on the five major law enforcement agencies' shooting instances in the Las Vegas Valley area. This work resulted in the Deadly Force database, which contained 378 shootings (142 fatal and 114 resulting in known wounds) with precise geo-locations. The Department of Justice confirmed and used the data in its own analysis.

The database is no longer online, but we contacted Lawrence Mower, one of the journalists in charge of creating this database, for more information about the Deadly Force's process. The project's event of interest was not solely police killings but, instead, police shootings without regard to whether a shooting resulted in death or injuries. The project aimed to track and analyze the conditions when officials decide to shoot their guns. They coded each event within 28 categories to collect specific details, including information about the police officers, the shooting subjects, and why police were involved in the situation.

Note that this database was not generated through media monitoring; multiple sources were used to compose each entry in the database. Given the level of detail required, the best sources were police investigative summaries completed by the department's homicide division. Other sources included coroner's inquest transcripts, arrests reports for shooting subjects, records from civil lawsuits, police press releases, records from the department's use of force review board, and news reports. The necessary police reports and coroner's inquests are unavailable in real-time and are costly. For example, Deadly Force spent $11,000 on police reports requests alone. They acknowledged that, in addition to the level of required detail, using public documents protected the project from claims about fabrication.

Deadly Force journalists found that under-reporting was a problem for shootings where no one was hit; therefore, news reports do not provide the detailed information required to meet the needs of this type of project. However, if a project's aim is limited to tracking fatal shootings local media will not miss these fatalities. Since news reports are released within a day after a fatal shooting, journalists rely on readily accessible and less detailed sources, including police press releases and, potentially, witness accounts. These reports likely contain a limited summary of the event, including the name of the officers involved, name of the person shot at, and basic characteristics of the situation; these details could be tracked through local media monitoring.

Geographical scope also determines the feasibility of media monitoring in real-time. Deadly Force was able to achieve a high level of information because it was limited to Las Vegas. All police shooting fatalities are not monitored or reported on a national-level due to varying public interest and under-reporting. To replicate a regional monitoring exercise on a national level would be very onerous and time consuming as a daily search protocol for each state for main and secondary news sources would be required.

Google Alerts could be established to detect instances of police killings; however, the more search terms included, the greater the number of alerts. Philip M. Stinson from Bowling Green State University created a police misconduct database, which includes incidents of officer arrests since 2005. The data-collection process relies on 48 Google Alerts for generic incidents, plus an additional Google Alert for the involved officer's name each time Stinson detects an arrest of a police officer for misconduct. The database currently includes up to 11,000 cases involving some 9,000 officers. Naturally, such an intensive effort requires matching resources; his team includes two graduate and ten undergraduate students working six to ten hours a week. At times, he had eight graduate assistants working twenty hours a week. News stories, via Google Alerts, are the mechanism to detect events while broader searches of non-news sources including court records and videos provide more detailed information on each event.

A-10. Ethnic violence monitoring using *The Times of India*

The Times of India newspaper has been used as a primary media source in notable media monitoring projects on ethnic violence in India. Ashutosh Varshney and Steve Wilkinson developed a dataset on Hindu-Muslim riots from 1950-1995 (2006) deriving data from *The Times of India, Bombay Edition*. Varshney and Wilkinson arrived at diverging conclusions from their shared dataset (personal communication, R. Dhattiwala, March 14, 2015).

Scholars like Dr. Raheel Dhattiwala adopted Varshney & Wilkinson's research methodology to conduct media monitoring on casualties from specific ethnic violence incidents in targeted regions in India. This media monitoring approach heavily relies on *The Times of India* as a primary source. Dhattiwala followed Varshney-Wilkinson's approach both in gathering data and coding data to conduct research on ethnic violence in Gujarat with Michael Biggs (2002).

Dhattiwala explains that *The Times of India, Ahmedabad Edition* was chosen due to its large circulation and credible reputation. Varshney and Wilkinson chose *The Times of India* partly because, "unlike several other newspapers, many a time [it] refused to run unchecked rumors about communal violence" (Dhattiwala & Biggs, 2012, p. 492). The newspaper's reporting in English was seen as a strength compared to more biased vernacular sources (personal communication, R. Dhattiwala, March 14, 2015). Local-language news sources had incentives to report biased articles and figures related to ethnic violence to please and increase their one-sided readership and, as a result, were less reliable than English-language news sources (personal communication, R. Dhattiwala, March 14, 2015).

Dhattiwala's monitoring was completely manual: generally in accordance with the Varshney-Wilkinson coding book, she either coded hard-copy articles directly or on an article in portable document format (PDF). The

coded information was entered manually into an Excel file and then uploaded to data analysis software STATA for analysis.

During this research, the newspaper casualty figures were gathered, coded, and triangulated with Intelligence Bureau and Concerned Citizens' Tribunal sources. There were instances when figures on casualties differed across these sources or from subsequent editions of *The Times of India* as new data became available over time. In these instances, Dhattiwala weighed the credibility of the source in determining which figure to include in the dataset; generally, legal documents were deemed the most reputable. When sources were all of the same credibility, the standard operating procedure was to take the lowest figure to ensure there was no over-reporting of casualties. In each of these instances a note was included in the dataset explaining why the figure was chosen to promote transparency.

Dhattiwala followed reporting over time because, she explained, more reliable information would often be available in later editions than in the first reports on an incident (personal communication, R. Dhattiwala, March 14, 2015). She noted in the case of ethnic violence in Gujarat, civil society groups over-reported casualty figures in the immediate aftermath of violent incidents, and she referenced HRW's report as an example of over-reported casualty figures. Given the urgency for HRW to report figures as soon as possible, this is not an easily resolved problem. Dr. Dhattiwala recommended considering releasing subsequent reports when more accurate data was available (personal communication, R. Dhattiwala, March 14, 2015).

Appendix B. Automated Event Data

B-1. Phoenix sources:

Historical data for 1979-2012 in the Phoenix system was drawn from the BBC's Summary of World News broadcasts. The data for 2014 onwards, which is updated and can be accessed on a daily basis, draws from 541 different RSS feeds. Nearly all of the sources are in English, with 91 sources in Arabic. The data coming from the Arabic RSS feeds are not currently being coded, but the Phoenix team anticipates doing native coding of Arabic news reports in the future. Since RSS feeds are not permanently available on the web, Phoenix is collecting them in order to have a substantial backlog of stories when they start coding them. Below is a randomized list of 100 of those RSS feeds.

News source	URL	Type	Language
aljazeera	http://america.aljazeera.com/content/ajam/articles.rss	international	english
ar_albayan_news	http://www.albayan.ae/1.447?ot=ot.AjaxPageLayout	international	arabic
ar_albayan_uae	http://www.albayan.ae/1.448?ot=ot.AjaxPageLayout	local	arabic
ar_arabnet5	http://www.arabnet5.com/rss-news-all.asp	international	arabic
ar_asharq_alawsat	http://www.aawsat.com/feed	international	arabic
ar_jordan_alanbat	http://www.alanbatnews.net/rss.php	local	arabic
ar_jordan_assabeel	http://www.assabeel.net/?format=feed&type=rss	international	arabic
ar_kuwait_alanba	http://www.alanba.com.kw/rss/newspaper	local	arabic
ar_kuwait_annaharkw	http://www.annaharkw.com/annahar/Rss.aspx	local	arabic
ar_libya_lana	http://www.lana-news.ly/ara/news/index.rss	international	arabic
ar_oman_alroeya	http://alroeya.ae/feed	local	arabic
ar_saudi_alriyadh	http://www.alriyadh.com/section.main.xml	international	arabic
ar_saudi_alyaum	http://www.alyaum.com/rss/section/home	international	arabic
ar_syria_sana	http://www.sana.sy/feed	international	arabic
asharq_al_awsat	http://www.aawsat.net/feed	international	english
asianage_delhi	http://www.asianage.com/rss/40	local	english
asiancorrespondent	http://asiancorrespondent.com/feed/	international	english
baltic_times	http://feeds.feedburner.com/TheBalticTimes?format=xml	local	english
bangkokpost_breaking	http://www.bangkokpost.com/rss/data/breakingnews.xml	local	english
bnn_australia	http://www.australianherald.com/index.php/rss/88f7d0d02bea1b33	international	english
bnn_centralasia	http://www.centralasiatimes.com/index.php/rss/929bcf2071e81801	international	english
bnn_ireland	http://www.irishsun.com/index.php/rss/aba4168066a10b8d	international	english
bnn_me	http://www.middleeaststar.com/index.php/rss/940f2bfd509e743b	international	english
bnn_nigeria	http://www.nigeriasun.com/index.php/rss/8db1f72cde37faf3	international	english
canada_globalnews	http://globalnews.ca/feed/	local	english
china_scmp_hk	http://www.scmp.com/rss/2/feed	international	english
china_scmp_world	http://www.scmp.com/rss/5/feed	international	english
chinapost_asia	http://www.chinapost.com.tw/rss/asia.xml	international	english
csm_politics	http://rss.csmonitor.com/feeds/politics?format=xml	international	english
csm_world	http://rss.csmonitor.com/feeds/world?format=xml	international	english

News source	URL	Type	Language
cyprus_mail	http://cyprus-mail.com/feed/	international	english
daily_monitor_uganda	http://www.monitor.co.ug/-/691150/691150/-/view/asFeed/-/11emxavz/-/index.xml	local	english
euronews	http://feeds.feedburner.com/euronews/en/home?format=xml	international	english
greece_kathimerini	http://ws.kathimerini.gr/xml_files/latestnews.xml	local	english
guardian_africa	http://www.theguardian.com/world/africa/roundup/rss	international	english
guardian_scasia	http://www.theguardian.com/world/southandcentralasia/roundup/rss	international	english
hindustan_dehradun	http://feeds.hindustantimes.com/HT-Dehradun?format=xml	local	english
hindustan_lucknow	http://feeds.hindustantimes.com/HT-Lucknow?format=xml	local	english
hindustan_ranchi	http://feeds.hindustantimes.com/HT-Ranchi?format=xml	local	english
hindustan_world	http://feeds.hindustantimes.com/HT-World?format=xml	local	english
hungary_budbusjourn	http://www.bbj.hu/assets/rss/rss.php	local	english
india_mint_econpol	http://www.livemint.com/rss/economy_politics	local	english
india_telegraph_calcutta	http://www.telegraphindia.com/feeds/rss.jsp?id=5	local	english
india_telegraph_jharkhand	http://www.telegraphindia.com/feeds/rss.jsp?id=23	local	english
insight	http://www.insightcrime.org/news/feed	international	english
int_the_news_islamabad	http://feeds.feedburner.com/TheNewsInternational-Islamabad?format=xml	local	english
int_the_news_peshawar	http://feeds.feedburner.com/TheNewsInternational-Peshawar?format=xml	local	english
ips_aid	http://www.ipsnews.net/news/development-aid/feed/	international	english
ips_headlines	http://www.ipsnews.net/news/headlines/feed/	international	english
ireland_rte	http://www.rte.ie/news/rss/news-headlines.xml	international	english
irin	http://www.irinnews.org/irin.xml	international	english
japan_times	http://www.japantimes.co.jp/feed/topstories/	local	english
jordan_times	http://feeds.feedburner.com/TheJordanTimes-LatestNews?format=xml	international	english
jpost_int	http://www.jpost.com/Rss/RssFeedsInternationalNews.aspx	international	english
maan_news	http://maannews.net/ENG/Rss.aspx?CID=NEW	international	english
maan_politics	http://maannews.net/ENG/Rss.aspx?CID=POL	international	english
maan_regional	http://maannews.net/ENG/Rss.aspx?CID=RGN	international	english
malstar_world	http://www.thestar.com.my/RSS/News/World/	international	english
mcclatchy_afpak	http://www.mcclatchydc.com/afghanistan-pakistan/v-rss/index.rss	international	english
mcclatchy_congress	http://www.mcclatchydc.com/congress/v-rss/index.rss	international	english
mcclatchy_courtscrime	http://www.mcclatchydc.com/courts-crime/v-rss/index.rss	local	english
mcclatchy_econ	http://www.mcclatchydc.com/economy/v-rss/index.rss	international	english
mcclatchy_nation	http://www.mcclatchydc.com/nation-news/v-rss/index.rss	international	english
mcclatchy_natsec	http://www.mcclatchydc.com/national-security/v-rss/index.rss	international	english
menafn_qatar	http://www.menafn.com/rss/menafn_Qatar.xml	international	english
menafn_syria	http://www.menafn.com/rss/menafn_Syria.xml	international	english
menafn_uae	http://www.menafn.com/rss/menafn_UAE.xml	international	english
menafn_yemen	http://www.menafn.com/rss/menafn_Yemen.xml	international	english
mercopress	http://en.mercopress.com/rss/	international	english
miami_haiti	http://www.miamiherald.com/news/americas/haiti/index.xml	local	english
miltimes_navy	http://projects.militarytimes.com/rss-feed/?sitename=Navy	international	english
nigeria_abusidiqu	http://abusidiqu.com/feed/	local	english

News source	URL	Type	Language
nigeria_advocate	http://theadvocatengr.com/new/?feed=rss2	local	english
nigeria_blueprint	http://www.blueprint.ng/feed/	local	english
nigeria_nationalmirror	http://nationalmirroronline.net/new/feed/	local	english
nigeria_standard	http://www.thenigeriastandard.com/index.php?format=feed&type=rss	local	english
nigeria_thepunch	http://www.punchng.com/feed/	local	english
nigeria_vangard	http://www.vanguardngr.com/feed/	local	english
nytasiapacific	http://rss.nytimes.com/services/xml/rss/nyt/AsiaPacific.xml	wire	english
pakistan_dailymessanger	http://dailymessenger.com.pk/feed/	local	english
philstar_nation	http://www.philstar.com/rss/nation	local	english
philstar_region	http://www.philstar.com/rss/region	local	english
reuters	http://feeds.reuters.com/Reuters/worldNews	wire	english
sacbee_state	http://www.sacbee.com/state/index.rss	local	english
sfgate_bayarea	http://www.sfgate.com/bayarea/feed/Bay-Area-News-429.php	local	english
skorea_chosun	http://english.chosun.com/site/data/rss/rss.xml	local	english
southaf_busdaily_world	http://www.bdlive.co.za/world/?service=rss	international	english
southaf_capetownt	http://www.iol.co.za/cmlink/1.1046095	local	english
southaf_iol_pretoria	http://www.iol.co.za/cmlink/1.1118954	local	english
southaf_mailg	http://mg.co.za/rss/	local	english
spiegel	http://www.spiegel.de/international/index.rss	international	english
taipeitimes_world	http://www.taipeitimes.com/xml/world.rss	international	english
toronto_star_canada	http://www.thestar.com/feeds.articles.news.canada.rss	international	english
transitions_centralasia	http://www.tol.org/client/region/4-central-asia.rss	international	english
transitions_centraleurope	http://www.tol.org/client/region/1-central-europe-baltics.rss	international	english
uganda_newvision_national	http://www.newvision.co.ug/feed.aspx?cat_id=1	local	english
un_americas	http://www.un.org/apps/news/rss/rss_americas.asp	international	english
un_asiapac	http://www.un.org/apps/news/rss/rss_asiapac.asp	international	english
voa_am	http://www.voanews.com/api/zoripegtim	international	english
voa_euro	http://www.voanews.com/api/zj$oveytit	international	english

B-2. Dictionaries

Below are two examples of automated dictionaries. The first is an issue dictionary regarding gender violence (v=verb; n=noun). When a story is read with any of the chosen phrases, it is coded as "gender violence," enabling information extracting from a variety of stories to be coded and aggregated. The second is an actor dictionary with the names of most prominent leaders and subgroups of ISIL. When a story is read with any of the chosen actor names, they are extracted for aggregation.

ISSUE CATEGORY: Gender Violence

violence against women	[GENDER_VIOLENCE]	sexual n:slave	[GENDER_VIOLENCE]
gender violence	[GENDER_VIOLENCE]	sexual slavery	[GENDER_VIOLENCE]
domestic violence	[GENDER_VIOLENCE]	sex abuse	[GENDER_VIOLENCE]
woman hate crime	[GENDER_VIOLENCE]	sex abuser	[GENDER_VIOLENCE]
v:beat his wife	[GENDER_VIOLENCE]	sexual abuse	[GENDER_VIOLENCE]
battered n:woman	[GENDER_VIOLENCE]	sexual abuser	[GENDER_VIOLENCE]
sexual violence	[GENDER_VIOLENCE]	sexual abusing	[GENDER_VIOLENCE]
intimate partner violence	[GENDER_VIOLENCE]	sexually abused	[GENDER_VIOLENCE]
honor n:killing	[GENDER_VIOLENCE]	sexual misconduct	[GENDER_VIOLENCE]
sexual v:exploit	[GENDER_VIOLENCE]	sexual violence	[GENDER_VIOLENCE]
sexually v:exploit	[GENDER_VIOLENCE]	gender+based violence	[GENDER_VIOLENCE]
sex n:crime	[GENDER_VIOLENCE]	n:rape	[RAPE]
sexual crime	[GENDER_VIOLENCE]	n:rapist	[RAPE]
sex n:slave	[GENDER_VIOLENCE]	v:rape	[RAPE]
sex slavery	[GENDER_VIOLENCE]		

ACTORS: New Syria Groups

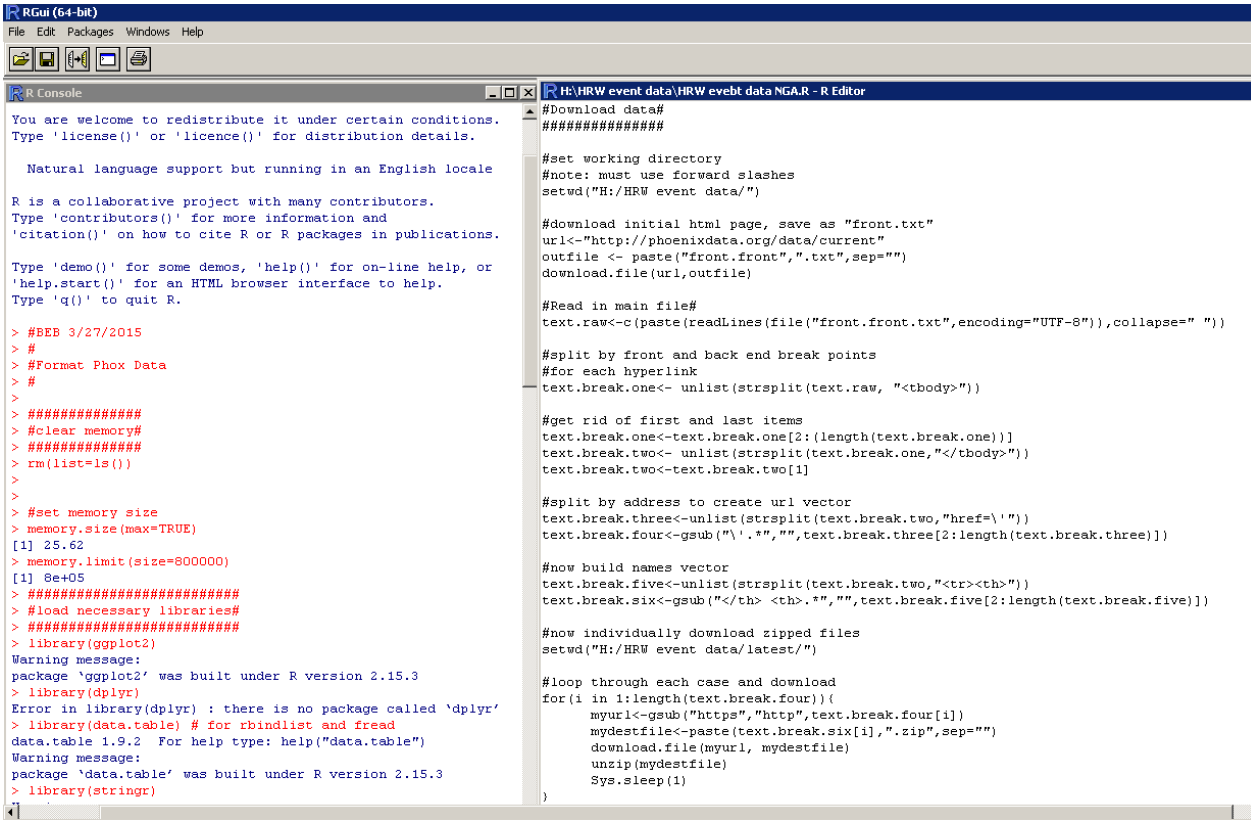
+ABU_MOHAMMAD_AL_JAWLANI_ ;
++ABU_MOHAMMAD_AL-JAWLANI_
++ABU_MOHAMMAD_AL-JOULANI_
++ABU_MOHAMMAD_AL-JOULANI_
++ABU_MOHAMMAD_AL-GOLANI_
+FREE_SYRIAN_ARMY_ ;
++ABU_BASSIR_AL_JEBLAWI_
++ABU_BASSIR_AL-JEBLAWI_
++LIWAA_AL_UMMA_
++LIWAA_AL-UMMA_
++LIWAA_AL_UMMAH_
++LIWAA_AL-UMMAH_
+COALITION_OF_SECULAR_AND_DEMOCRATIC_SYRIANS_ ;
++_SYRIAN_COALITION_OF_SECULAR_AND_DEMOCRATIC_FORCES_
++RANDA_KASSIS_
+DAMASCUS_DECLARATION_
++MICHEL_KILO_
++ABDULRAZAK_EID_
++ABDUL_RAZZAK_EID_
++ABDUL_RAZAQ_EID_
++ABDEL_RAZZAK_EID_
++ABDUL_RAZZAQ_EID_
++ABD_AL_RAZZAQ_'ID_
+JAISH_AL_MUHAJIREEN_WAL_ANSAR_ ;
++JAISH_AL-MUHAJIREEN_WAL-ANSAR_
++MUHAJIREEN_BRIGADE_
++KATAEB_AL_MUJAHIREEN
++KATAEB_AL-MUJAHIREEN_
++KATIBAT_AL_MUHAJIREEN
++KATIBAT_AL-MUHAJIREEN_
++ABU_OMAR_AL_CHECHEN_
++ABU_OMAR_AL-CHECHEN_
++ABU_OMAR_AL_SHISHANI_
++ABU_OMAR_AL-SHISHANI_
++SALAHUDDIN_AL-CHECHEN_
++SALAHUDDIN_AL-CHECHEN_
+JABHAT_AL_NUSRA_ ;
++NUSRA_FRONT_
++JABHAT_AL-NUSRA_
++AL-NUSRA_FRONT_
++JABHAT_AL_NUSRAH_
++NUSRAH_FRONT_
++JABHAT_AL-NUSRAH_
++AL-NUSRAH_FRONT_
++ABU_MUHAMMAD_AL-JOULANI_
++AL-JOULANI_
++JOULANI_
++ABU_MUHAMMAD_AL_JOULANI_
++AL_JOULANI_
+SUPREME_COUNCIL_OF_THE_SYRIAN_REVOLUTION_ ;
+MOVEMENT_FOR_JUSTICE_AND_DEVELOPMENT_IN_SYRIA_ ;
++ḤARAKAT_AL-'IDALAT_WAL-BANA'A_FI_SURIYAH_
+RIAD_SEIF ;
+MOAZ_AL_KHATIB_ ;
++MOAZ_AL-KHATIB_
++AHMAD_MOUATH_AL_KHATIB_AL_HASANI_
++AHMAD_MOUATH_AL-KHATIB_AL-HASANI_
+SYRIAN_ISLAMIC_FRONT_
+SYRIAN_NATIONAL_COUNCIL_ ;
++SYRIAN_NATIONAL_TRANSITIONAL_COUNCIL_
++NATIONAL_COUNCIL_OF_SYRIA_
+SYRIAN_NATIONAL_COALITION_ ;
++NATIONAL_COALITION_FOR_SYRIAN_REVOLUTIONARY_AND_OPPOSITION_FORCES_
++MOUAZ_AL_KHATEEB_
++MOUAZ_AL-KHATEEB_
++MOUAZ_AL_KHATIB_
++MOUAZ_AL-KHATIB_
+AHRAR_AL_SHAM_ ;
++AHRAR_AL-SHAM_
++AHRAR_ASH_SHAM_
++AHRAR_ASH-SHAM_
++ABU_KHAHLID_AL_SURI_
++ABU_KHAHLID_AL-SURI_
++ABU_ABDULLAH_AL_HAMAWI_
++ABU_ABDULLAH_AL-HAMAWI_
++HARAKAT_AHRAR_AL_SHAM_AL_ISLAMIYYA_
++HARAKAT_AHRAR_AL-SHAM_AL-ISLAMIYYA_
++ABU_OBEIDA_AL_BINNISHI
++ABU_OBEIDA_AL-BINNISHI_
+SUQOUR_AL_SHAM_BRIGADE_ ;
++SUQOUR_AL-SHAM_BRIGADE_
++SHAM_FALCONS_BRIGADE
++AHMED_ABU_ISSA_
++ABU_HUSSEIN_AL_DIK_
++ABU_HUSSEIN_AL-DIK_
+GHURABA_AL_SHAM_ ;
+GHURABA_AL-SHAM_
+TAWHID_BRIGADE_ ;
++AL_TAWHID_BRIGADE_
++AL-TAWHID_BRIGADE_
++AHRAR_AL_SHAMAL_BRIGADE_
++AHRAR_AL-SHAMAL_BRIGADE_
++LIWA_AL_TAWHID_
++LIWA_AL-TAWHID_
++DARET_IZZA_BRIGADE_
++FURSAN_AL_JABAL_BRIGADE_
++FURSAN_AL-JABAL_BRIGADE_
++ABU_FURAT_
+JAYSH_AL_SHA'BI_ ;
++JAYSH_AL-SHA'BI_
++JAISH_AL_SHA'BI_
++JAISH_ASH_SHA'BI_
++JAISH_AL-SHA'BI_
++JAISH_AL_SHA'ABI_
++JAISH_AL-SHA'ABI_
++JAYSH_AL_SHA'ABI_
++JAYSH_AL-SHA'ABI_
++JAISH_AL_SHABI_
++JAISH_AL-SHABI_
++JAYSH_AL_SHABI_
++JAYSH_AL-SHAABI_
++JAISH_AL_SHAABI_
++JAISH_AL-SHAABI_
++JAYSH_AL_SHAABI_
++JAYSH_AL-SHAABI_
+SYRIAN_OBSERVATORY_FOR_HUMAN_RIGHTS_ ;
++RAMI_ABDULRAHMAN_
+THE_ISLAMIC_FRONT_ ;
++AL-JABHAT_AL-ISLAMIYYAH_
++AHMED_ABU_ISSA_
++AMAD_ESSA_AL-SHEIKH_
+ISLAMIC_STATE_OF_IRAQ_AND_THE_LEVANT_; kkl mod

++ISLAMIC_STATE_OF_IRAQ_
++ISLAMIC_STATE_OF_IRAQ_AND_SYRIA_
++ISLAMIC_STATE_OF_IRAQ_AND_AL_SHAM_
++ISLAMIC_STATE_OF_IRAQ_AND_AL-SHAM_
++ISLAMIC_STATE_OF_IRAQ_AND_SHAM_
++TANZEEM_QAEDAT_AL-JIHAD_FI_BILAD_AL-RAFIDAYN_
++AL-QAEDA_IN_IRAQ_
++AL_QAEDA_IN_IRAQ_
++AL-QAEDA_IN_IRAQ_
++AQI_
++ABU_BAKR_AL_BAGHDADI
++ABU_BAKR_AL-BAGHDADI_
++ABU_OMAR_AL_BAGHDADI_
++ABU_OMAR_AL-BAGHDADI_
++ABU_MUZAB_AL-ZARQAWI_
++ZARQAWI_
++ABU_OMAR_AL-BAGHDADI_
++MUJAHIDEEN_SHURA_COUNCIL_
++ABU_BAKR_AL-BAGHDADI_
++TAWHID_AND_JIHAD_
++AL-TAWHID_
++TAWHID_WAL-JIHAD_
++TAWHID_AL-JIHAD_
++AL-ZARQAWI_NETWORK_
++MONOTHEISM_AND_HOLY_STRUGGLE_
++TANZIM_QAIDAT_AL-JIHAD_FI_BILAD_AL-RAFIDAYN_
++UNIFICATION_AND_JIHAD_
++THE_ORGANIZATION_OF_MONOTHEISM_AND_JIHAD_
++JAMA'AT_AL-TAWHID_WAL-JIHAD_
++TANZIM_QAIDAT_AL-JIHAD_FI_BILAD_AL-RAFIDAYN_
+AL-DAWLA_AL-ISLAMIYA_FI_AL-IRAQ_WA_AL-SHAM_
++ISIS_
++ISIL_
++DAIISH_
++DA'ESH_
++DAESH_
++TANZEEM_QAEDAT_AL-JIHAD_FI_BILAD_AL-RAFIDAYN_
++ABU_MUZAB_AL-ZARQAWI_
++ABU_OMAR_AL-BAGHDADI_
++ABU_AYYUB_AL-MASRI_ ; (killed in 2010)
++ABU_ABDULLAH AL-RASHID AL-BAGHDADI_ ; (killed in 2010)
++ABU_BAKR_AL-BAGHDADI_
++ABU_ANAS AL-SHAMI_; (killed in 2004)
++ABU_AZZAM_; (killed in 2005)
++ABU_OMAR AL-KURDI_; (captured in 2005)
++ABU_OMAR AL-SHISHANI_
++ABDUL_HADI AL-IRAQI_; (captured in 2006)
++ABU_YAQUB AL-MASRI_; (killed in 2007)
++HAITHAM_AL-BADRI_; (killed in 2007)
++HAMID_JUMA FARIS JOURI AL-SAEEDI_ ; (captured in 2006)
++KHALED_AL-MASHHADANI_ ; (captured in 2007)
++MAHIR_AL-ZUBAYDI_ ; (killed in 2008)
++MOHAMED_MOUMOU_ ; (killed in 2008)
++SHEIK_ABD-AL-RAHMAN_ ; (killed in 2006)
++HUTHAIFA_AL-BATAWI_ ; (killed in 2011)

B-3. Test of Phoenix data: Boko Haram kidnappings

To test the utility of Phoenix data, we extracted events of kidnappings by Boko Haram in Nigeria from June 20, 2014 (the earliest date Phoenix data is available) to April 7, 2015. A new file is uploaded every day. Unfortunately, because data was unavailable for the period covered in the HRW report on Boko Haram, we could not compare our results to the findings of the HRW report, but this exercise can still illustrate the potential as well as the limitations of automated event data. It should be remembered that Phoenix is still in Beta phase, so some problems and subsequent alterations to the programming are expected.

First, researchers manipulate Phoenix data in R statistical software. Once a dataset is created, it can be exported into any format and used in any software, such as Excel or STATA. The following image is the screen-capture of our R console. The script, which we can share with HRW, downloads the data, loads it into R, and subsets the required actors and actions. The same script can be used repeatedly for different searches with the only changes required being the proper codes for the action and actors.



The **source+target+action** combination we used was NGAREB + NGACIV + 1811. NGAREB is the code for the **source** of the action; in this case, Nigerian rebel groups. NGACIV refers to the **target** of the action; in this case, Nigerian civilians. Lastly, "181" is the code for the **action** "abduct, hijack, take hostage." Running this query on the Phoenix database for the period of interest produced a dataset that we exported to Excel (below). The computer took 12 minutes to download the data and create 292 daily files, and it took 4 seconds to aggregate those files and subset the events of interest.

Using this method, we counted 40 distinct events over the chosen time period. This number looked exceedingly high, so we inspected the data for over-counting and considered the potential explanations for this problem. One reason the count seems to high could be that we searched for actions with the generic code of NGAREB, which includes Boko Haram but might easily pick up actions committed by another Nigerian rebel group. One advantage of the Phoenix report is that it includes the URL for each event, meaning we were able to quickly inspect each story to check whether it referred to Boko Haram.

The second potential reason for over-counting is false-positives, or non-events that found their way into the dataset. When news reports refer to past events to provide context, the system is likely to incorrectly pick up this information as an event of interest for the specified timeframe. For example, on July 15, 2014 the Nigeria Sun newspaper published an article on the visit of activist Malala Yousafzai to Nigeria to advocate for the return of the school girls kidnapped by Boko Haram three months earlier in Chibok. The information included in this story was coded as a kidnapping that occurred on July 15th even though it was actually contextual information in the article.

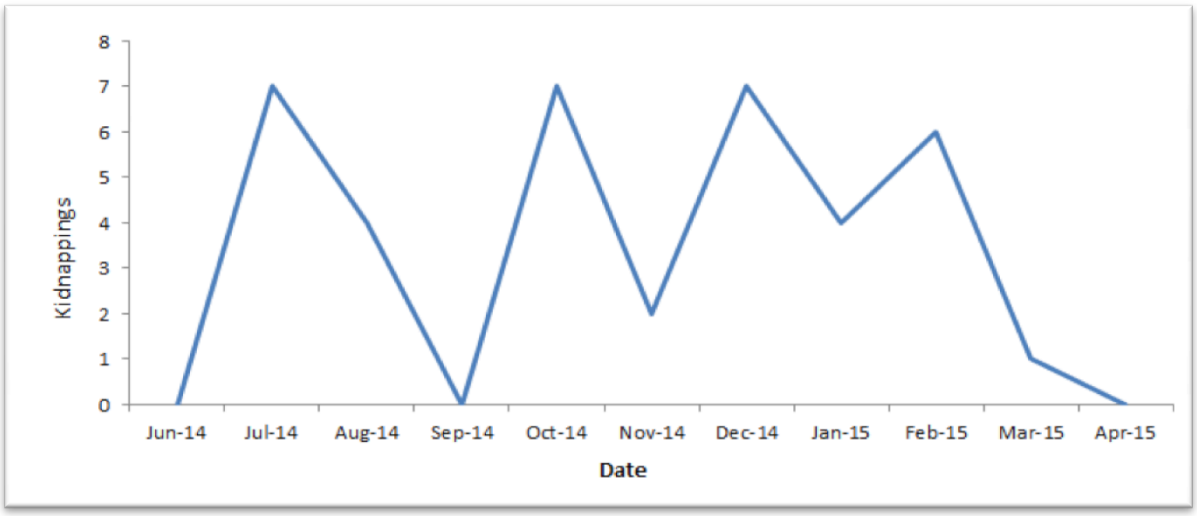
The third explanation for the over-counting is duplication: the same event appears more than once. Phoenix's software automatically de-duplicates same-day events; that is, it will not allow for the extraction of more than one event with the same characteristics on the same day. This is why we see that some events have more than one URL address in the dataset: it is the product of the de-duplication process aggregating all the URLs reporting the same event. Yet this feature is not infallible. When reports vary considerably in the language with which they report the same event, they may be coded slightly differently by the system, resulting in those events getting missed by the de-duplication process and making it into the final dataset. Thus, it is important to check the URL of each event to discard false-positives and duplicates.

(Continues on next page)

Aggregated by month, this is what the trend looks like:

	A	C	D	E	F	G	H	I	J	K	L	M	N	Y	Z
1	EventID	Year	Month	Day	SourceAct	SourceAct	SourceAct	SourceAct	TargetAct	TargetAct	TargetAct	TargetAct	EventCod	URLs	NewsSources
2	43312_v0.2.0	2014	7	2	NGAREB	NGA	REB		NGACVL	NGA	CVL		181	http://article.wn.com/view/2014/07/02/Sleepless_N	wn_africa
3	80230_v0.2.0	2014	7	11	NGAREB	NGA	REB		NGA	NGA			181	http://www.nigeriasun.com/index.php/sid/2237048	bnn_nigeria
4	84434_v0.2.0	2014	7	14	NGAREB	NGA	REB		NGACVL	NGA	CVL		181	http://article.wn.com/view/2014/07/14/Extremists_	wn_africa
5	89934_v0.2.0	2014	7	14	NGA	NGA			NGACVL	NGA	CVL		181	http://www.nigeriasun.com/index.php/sid/2237883	bnn_nigeria;bnn_africa
6	107368_v0.2.0	2014	7	18	NGAREB	NGA	REB		NGACVLU	NGA	CVL	UAF	181	http://article.wn.com/view/2014/07/18/German_ab	wn_world
7	119606_v0.2.0	2014	7	22	NGAREB	NGA	REB		NGA	NGA			181	http://article.wn.com/view/2014/07/22/Britain_UN_	wn_world
8	166242_v0.2.0	2014	7	31	NGA	NGA			NGACVL	NGA	CVL		181	http://AllAfrica.com/stories/201407311176.html;htt	allafrica;allafrica
9	194304_v0.2.0	2014	8	8	NGAREBU	NGA	REB	UAF	NGACVL	NGA	CVL		181	http://article.wn.com/view/2014/08/08/Hundreds_(	wn_world
10	221711_v0.2.0	2014	8	16	NGAREB	NGA	REB		NGACVL	NGA	CVL		181	http://article.wn.com/view/2014/08/16/Nigerian_of	wn_world
11	226464_v0.2.0	2014	8	16	NGAREBM	NGA	REB	MUS	NGA	NGA			181	http://www.nigeriasun.com/index.php/sid/2248131	bnn_nigeria;bnn_africa
12	237883_v0.2.0	2014	8	20	NGAREB	NGA	REB		NGA	NGA			181	http://dailyindependentnig.com/2014/08/boko-hara	nigeria_dailyindepend
13	384180_v0.2.0	2014	10	19	NGA	NGA			NGACVL	NGA	CVL		181	http://www.nigeriasun.com/index.php/sid/2268065	bnn_nigeria
14	385172_v0.2.0	2014	10	18	NGA	NGA			NGACVL	NGA	CVL		181	http://www.csmonitor.com/World/Latest-News-Wi	csm_world
15	396333_v0.2.0	2014	10	23	NGAREBU	NGA	REB	UAF	NGA	NGA			181	http://cyprus-mail.com/2014/ /23/suspected-boko	cyprus_mail;china_scm
16	398260_v0.2.0	2014	10	24	NGAREBU	NGA	REB	UAF	NGA	NGA			181	http://www.dailystar.com.lb/News/World/2014/Oct	daily_start_int
17	398876_v0.2.0	2014	10	22	NGAREBU	NGA	REB	UAF	NGA	NGA			181	http://www.todayszaman.com/world_suspected-bo	zaman;zaman;zaman;z
18	401717_v0.2.0	2014	10	24	NGAREBG	NGA	REB	GOV	NGA	NGA			181	http://dailypost.ng/2014/10/24/chadian-ministry-of	nigeria_dailypost
19	407076_v0.2.0	2014	10	27	NGAREBU	NGA	REB	UAF	NGACVL	NGA	CVL		181	http://www.nigeriasun.com/index.php/sid/2270550	bnn_nigeria;bbc;nigeri
20	411462_v0.2.0	2014	11	1	NGAREB	NGA	REB		NGA	NGA			181	http://feedproxy.google.com/~	frica_newstime;aljaze
21	439448_v0.2.0	2014	11	20	NGAREBM	NGA	REB	MUS;UAF	NGACVL	NGA	CVL		181	http://www.thehindu.co	nat
22	465225_v0.2.0	2014	12	1	NGAREB	NGA	REB		NGA	NGA			181	http://article.wn.com/v	
23	495736_v0.2.0	2014	12	16	NGAREB	NGA	REB		NGA	NGA			181	http://dailymessenger.c	_dailymessan
24	498745_v0.2.0	2014	12	18	NGAREBU	NGA	REB	UAF	NGA	NGA			181	http://feedproxy.google.c	ews
25	499145_v0.2.0	2014	12	18	NGAREB	NGA	REB		NGA	NGA			181	http://www.hindustantimes.com/	ndustan_world;franc
26	501071_v0.2.0	2014	12	18	NGAREB	NGA	REB		NGACVL	NGA	CVL		181	http://www.bangkokpost.com/news/world/450696/	thailand_bankokpost;r
27	502513_v0.2.0	2014	12	18	NGAREB	NGA	REB		NGA	NGA			181	http://www.france24.com/en/20141218-dugain-mal	france24_asiap;thailan
28	504728_v0.2.0	2014	12	19	NGAREB	NGA	REB		NGA	NGA			181	http://www.asianage.com/international/boko-haraı	asianage_int;chinapos
29	535598_v0.2.0	2015	1	11	NGAREB	NGA	REB		NGACVL	NGA	CVL		181	http://www.nzherald.co.nz/world/news/article.cfm	nzherald_world;nzher
30	568968_v0.2.0	2015	1	28	NGAREBU	NGA	REB	UAF	NGACVL	NGA	CVL		181	http://article.wn.com/view/2015/01/28/DPRK_confi	wn_asia
31	575833_v0.2.0	2015	1	29	NGAREBU	NGA	REB	UAF	NGACVL	NGA	CVL		181	http://article.wn.com/view/2015/01/29/Raul_Castro	wn_world
32	589010_v0.2.0	2015	1	31	NGAREBU	NGA	REB	UAF	NGACVL	NGA	CVL		181	http://article.wn.com/view/2015/01/31/Islamic_Stat	wn_world
33	599029_v0.2.0	2015	2	3	NGAREBU	NGA	REB	UAF	NGACVL	NGA	CVL		181	http://article.wn.com/view/2015/02/03/US_diploma	wn_politics
34	606542_v0.2.0	2015	2	7	NGAREBU	NGA	REB	UAF	NGACVL	NGA	CVL		181	http://article.wn.com/view/2015/02/07/Boko_Haran	wn_africa
35	622721_v0.2.0	2015	2	9	NGAREB	NGA	REB		NGACVL	NGA	CVL		181	http://article.wn.com/view/2015/02/09/Boko_Haran	wn_africa

URLs of stories



The greatest utility of Phoenix data is to provide fairly accurate trends over time. The global focus of the project limits its utility for tracking every single event in a specific location. For this reason, it is worth thinking about this system as an uncalibrated scale that will not provide a single precise, true measure but will nonetheless capture proper variation over time.

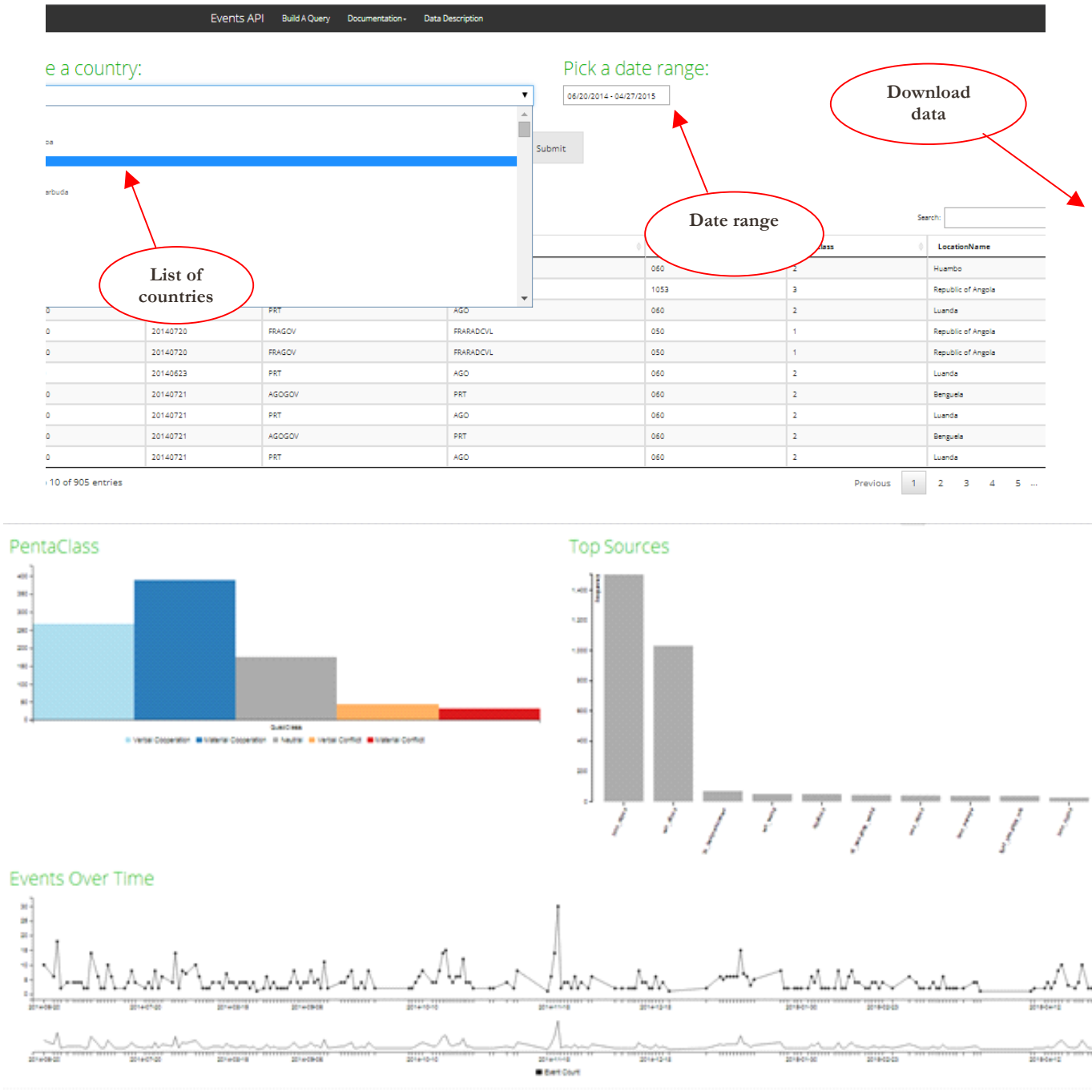
It should also be noted that start-up costs for using Phoenix are low; all that is required is basic knowledge of R while replication for multiple projects is costless. For example, in September 2013 HRW published a report titled "Tightening the Screws. Azerbaijan's Crackdown on Civil Society and Dissent." Researchers could have complemented field interviews with event data from Phoenix using the following source+target+action combinations:

a) AZEGOV+AZENGO+172, where AZEGOV is the code for the Azerbaijani government, AZENGO the code for Azerbaijani NGOs, and 172 the action code for "Name Impose administrative sanctions," defined as formal decrees, laws, or policies aimed at curbing the rights of civilians. The query could also be done for legislative and judicial actors as sources (AZELEG and AZEJUD respectively).

b) AZEPOL+AZENGO+173, where AZEPOL is the code for the Azerbaijani police forces and 173 is the action code for "arrest, detain, or charge with legal action".

B-4. Prospect of collaboration with Caerus

The analytics company Caerus is part of the consortium that created Phoenix. We have been in touch with their analysts, and they expressed an interest in working with HRW at a reduced fee. Acquiring their services could result in a completely customized automated system for HRW's various research needs, including customized selection of sources and development of dictionaries. It would take several weeks to a month to create each project, and Caerus would run a pilot for three months, during which HRW would not need to process the data in R. Caerus would provide a user-friendly online dashboard similar to the one below. On this platform HRW researchers could browse and graph the data in addition to downloading it in Excel format to manipulate it offline.



B-5. Application of automated media monitoring for a potential HRW project on police killings in the USA

In our findings we referenced Philip M. Stinson's database on police misconduct; a project that set up 48 Google Alerts to detect news stories about police misconduct, along with subsequent individual Google Alerts for the name of each officer featured in one of those stories (around 6,000 names). The project relied on 10 Gmail addresses to collect the alerts and a team of eight students to process them. An automated EMM system could provide this kind of information in a much faster and cheaper way; automated EMM is suited for the kind of situations in which problems come not from scarcity of sources but from their overabundance. Due to the specificity of the event of interest (police killings) and the limited geographical scope (U.S.), this project would require a customized automated system. An analytics company could do the programming; informed by previous research and HRW's expertise on the subject matter.

A ready-to-use system like Phoenix would not be suitable for this task since it is most likely local newspapers at the city level that will capture police killings (See Appendix A-9). Phoenix's global focus limits the number of U.S. local newspapers included; programmers would set up appropriate lists of local and national newspaper feeds, taking into account geographic and demographical representativeness.

The second step would be to create the dictionary. Fortunately, a U.S.-focused project would mean dictionaries would require the English language. Phoenix's dictionary technically includes the appropriate codes (USACOP+USACIV+1823: kill by physical assault). Nonetheless, a customized dictionary created specifically for the purpose of detecting this particular event would allow for much more precision. Interestingly, the 48 Google Alerts fulfill the role that dictionaries have in automated EMM[1].

1. The 48 alerts were set up for the following terms: "agent was arrested," "agent was charged," "agent was convicted," "agent was indicted," "deputy was arrested," "deputy was charged," "deputy was convicted," "detective was arrested," "detective was charged," "detective was convicted," "detective was indicted," "detectives were arrested," "detectives were charged," "detectives were convicted," "detectives were indicted," "officer charged," "officer was charged," "police chief was arrested," "police chief was charged," "police chief was convicted," "police officer was arrested," "police officer was charged," "police officer was convicted," "police officers were indicted," "police officers were charged," "police officers were convicted," "sheriff was arrested," "sheriff was charged," "sheriff was convicted," "trooper was convicted," "trooper was arrested," "trooper was charged," "trooper was convicted," police "captain was arrested," police "captain was charged," police "captain was convicted," police "captain was indicted," police "lieutenant was arrested," police "lieutenant was charged," police "lieutenant was convicted," police "lieutenant was indicted," police "officer is charged," police "sergeant was arrested," police "sergeant was charged," police "sergeant was convicted," police "sergeant was indicted."

Appendix C: Key Informant Interviews

	Date	Informant Name	Organization	Position
1	2/12/2015	Amanda Murdie	University of Missouri	Professor
2	2/12/2015	Brian Phillips	CIDE	Professor
3	2/19/2015	Howard Ramos	Dalhousie University	Associate Professor
4	3/5/2015	Michael Flynn	Global Detention Project	Executive Director
5	3/5/2015	Ben Bagozzi	University of Minnesota Political Science	Professor
6	3/11/2015	John Sloboda and Hamit Dardagan	Iraq Body Count/Every Casualty Counts	Researchers
7	3/14/2015	Raheel Dhattiwala	The Hindu Center for Politics and Public Policy (formerly at Nuffield College, University of Oxford)	PhD Graduate
8	3/16/2015	Lawrence Mower	Palm Beach Post (former Las Vegas RJ)	Journalist
9	3/24/2015	Giovanna Maiola	Osservatorio di Pavia	Media Analyst
10	3/26/2015	David Shirk	University of San Diego, Trans-Border Institute	Professor
11	3/26/2015	Randy Kluver and Steve Balfour	Texas A&M and MMS	Executive Director
12	4/7/2015	Shannon Golden	Humphrey School of Public Affairs	Professor
13	4/15/2015	Sarah Macharia	Global Media Monitoring Project	Practitioner
14	4/15/2015	Giovanna Dell'Orto	University of Minnesota School of Journalism	Professor

Appendix D. Coder Reliability Tests

Reliability tests can be conducted among coders and over time to verify that multiple coders are consistently reaching the same findings. Reliability of coding is crucial as the interpretation of data must be as consistent and objective as possible to ensure the accuracy of the data generated.

Inter-coder reliability tests are conducted by having multiple coders code the same article and then comparing the results to ensure they are the same. If results vary, there should be discussions between the coders and the supervisor to determine why there is variation and identify one common interpretation for the discrepancy moving forward. Ideally, training will take place before a project is implemented to ensure that coders are interpreting the information in the same way from the start. Further, developing a clear codebook with guidance for complex and uncertain coding decisions will decrease coding decisions based on individual coder discretion and experience. If a coder must make a coding decision at her discretion, she should flag that instance and consult with peers.

Time reliability tests are another means of confirming the accuracy of coders. One coder is assigned an article to analyze, and after a period of time she is given the same article to code again to verify coding is completed in a consistent manner over time. This can also be done through interval checks on coding by a supervisor. This method is particularly useful for projects where there is only a single coder.

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